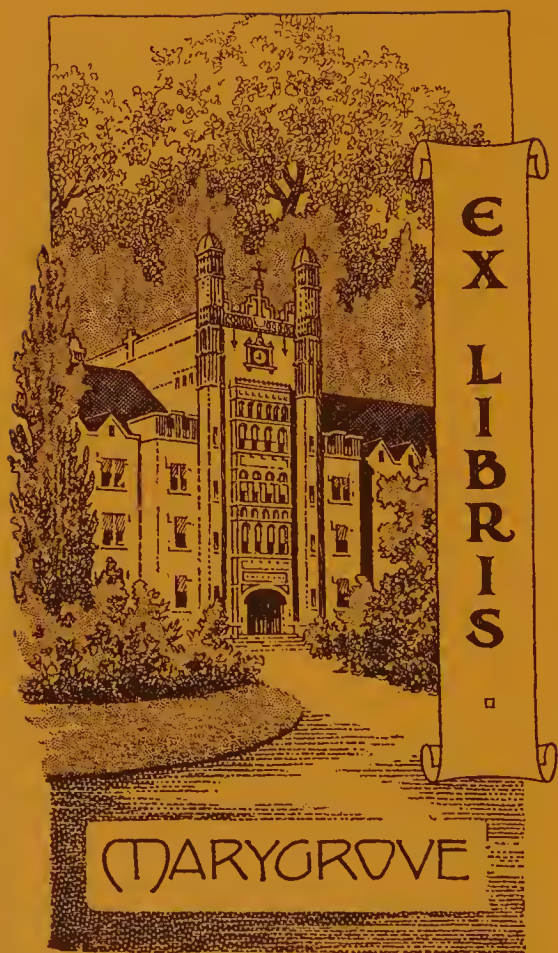


# NATIONAL SOCIETY FOR THE STUDY OF EDUCATION

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NATIONAL SOCIETY FOR THE  
STUDY OF EDUCATION

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Yearbook Publications

VOLUME IV  
YEARBOOKS XIII-XV, Part I  
1914 to 1916

PUBLIC SCHOOL PUBLISHING COMPANY  
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## SUMMARY OF YEARBOOKS XIII THROUGH XV, PART I

### THE THIRTEENTH YEARBOOK, PART I (1914)

#### SOME ASPECTS OF HIGH-SCHOOL INSTRUCTION AND ADMINISTRATION

E. R. Breslich, L. D. Coffman, W. A. Jessup, and H. C. Morrison

The three sections of this yearbook are devoted to a discussion of reconstructed mathematics, supervised study, and North Central High Schools, respectively. The first discusses very concretely needed re-adjustments in the subject of mathematics. The second presents the fundamental principles at the basis of the movement for supervised study, together with a review of the experiments that had been tried in various parts of the country. The last paper shows that a clear understanding of existing conditions with respect to the quality of the teaching staff is one of the most important steps in the direction of reconstruction of the subjects of the curriculum.

### THE THIRTEENTH YEARBOOK, PART II (1914)

#### PLANS FOR ORGANIZING SCHOOL SURVEYS, WITH A SUMMARY OF TYPICAL SCHOOL SURVEYS

Charles H. Judd and Henry L. Smith

The first paper in this volume treats the problem of school surveys from three angles: the conditions necessitating careful study of local school situations; the forces that can most safely and profitably be intrusted with making local surveys; and a possible method of approach to the problem in cities of from five to fifty thousand inhabitants. The second paper, by Professor Judd, includes accounts of all major surveys up to 1914, and gives a view of the different types of such inquiries.

### THE FOURTEENTH YEARBOOK, PART I (1915)

#### MINIMUM ESSENTIALS IN ELEMENTARY-SCHOOL SUBJECTS—STANDARDS AND CURRENT PRACTICES

W. C. Bagley, S. A. Courtis, F. N. Freeman, W. S. Gray, H. W. Holmes,  
J. F. Hosie, W. A. Jessup, R. G. Jones, H. C. Pryor,  
F. E. Thompson, and H. B. Wilson

This yearbook is the 1915 report of investigators coöperating with the Committee of the Department of Superintendence of the National Education Association on Economy of Time in Education, H. B. Wilson, chairman. Three other important yearbooks of the Society (XVI, Part I; XVII, Part I; and XVIII, Part II) are devoted to the subsequent reports of this important

committee. This report has to do with means of developing a program for economizing time in the elementary school. A general survey is presented, showing how time is at present distributed in representative cities and describing typical experiments for gaining economy. The bulk of the report deals with minimal standards in reading, handwriting, spelling, composition, grammar, arithmetic, geography, history, and literature, and represents a series of efforts by different contributors to determine for these subjects just what topics or aspects are truly essential.

## THE FOURTEENTH YEARBOOK, PART II (1915)

### METHODS FOR MEASURING TEACHERS' EFFICIENCY

Arthur C. Boyce

The author of this monograph calls attention first to the need for rating teachers and to the many inadequacies of the schemes for rating that are in common use. To meet this need and overcome these weaknesses, he proposes a method for rating which features a selected list of traits, a careful definition of these traits, and a graphic method for doing the rating. He also sets forth the results obtained by his method and discusses the relative importance of the several qualities of merit in teachers. Mr. Boyce's rating scale has attracted much attention and, in its original form or with variations, has been employed in the rating of large numbers of teachers.

## THE FIFTEENTH YEARBOOK, PART I (1916)

### STANDARDS AND TESTS FOR THE MEASUREMENT OF THE EFFICIENCY OF SCHOOLS AND SCHOOL SYSTEMS

B. T. Baldwin, F. W. Ballou, D. C. Bliss, B. R. Buckingham, H. G. Childs,  
S. A. Courtis, E. P. Cubberley, C. H. Judd, George Melcher, E. E.  
Oberholtzer, J. B. Sears, Daniel Starch, G. D. Strayer, M. R.  
Trabue, and G. M. Whipple

This volume is the report of the Committee of the National Council of Education of the National Education Association, under the chairmanship of G. D. Strayer, assisted by several invited collaborators. The fifteen chapters are grouped into two sections. Section I deals with the derivation of scales and units of measurement, including scales for physical growth and for arithmetic, score cards for city school buildings, and completion tests for school use. Section II deals with the application of scales and units of measurement in the work of educational supervision and administration. Among the systems from which accounts of the use of measuring scales are reported are Boston; Montclair; Bloomington, Indiana; Detroit; Salt Lake City; Kansas City, Missouri; Tulsa, Oklahoma; Oakland, California; Cleveland, Ohio; and Madison, Wisconsin.



# THE THIRTEENTH YEARBOOK

OF THE  
NATIONAL SOCIETY FOR THE STUDY  
OF EDUCATION

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## PART I

SOME ASPECTS OF HIGH-SCHOOL INSTRUCTION AND  
ADMINISTRATION:

RECONSTRUCTED MATHEMATICS  
SUPERVISED STUDY  
NORTH CENTRAL HIGH SCHOOLS

BY

H. C. MORRISON, E. R. BRESLICH, L. D. COFFMAN,  
W. A. JESSUP

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*Edited by* S. CHESTER PARKER, *Secretary*

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THIS YEARBOOK WILL BE DISCUSSED AT THE RICHMOND MEETING OF THE  
NATIONAL SOCIETY, MONDAY, FEBRUARY 23, 1914, 8:00 P.M.

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## TABLE OF CONTENTS

	PAGE
PREFACE . . . . .	7
I. RECONSTRUCTED MATHEMATICS IN THE HIGH SCHOOL: THE ADAPTATION OF INSTRUCTION TO THE NEEDS, INTERESTS, AND CAPACITIES OF STUDENTS . . . . .	9
HENRY C. MORRISON, Superintendent of Public Instruction for New Hampshire, Concord, N.H.	
II. SUPERVISED STUDY AS A MEANS OF PROVIDING SUPPLE- MENTARY INDIVIDUAL INSTRUCTION . . . . .	32
E. R. BRESLICH, Department of Mathematics, University High School, University of Chicago	
III. NORTH CENTRAL HIGH SCHOOLS . . . . .	73
WALTER A. JESSUP, Professor of Education, University of Iowa, Iowa City, Iowa, and LOTUS D. COFFMAN, Professor of Educa- tion, University of Illinois, Urbana, Illinois.	



## PREFACE

The rapid growth and modification of American high schools in recent years have developed a large series of problems which are of interest to thousands of administrators and teachers. A number of these problems will be discussed in this yearbook and in others that are to follow. The policy which has characterized the preparation of the yearbooks in recent years will be continued, namely, to publish discussions that will deal directly with the practical problems of readjustment that now confront American educators, and to include descriptions and suggestions that will prove of direct practical value to teachers and administrators in solving these problems in their own schools.

The reconstruction of the material of all the subjects in the curriculum is one of the most pressing needs, owing to the new type of high-school students now constituting such a large part of the student body. The reconstruction of mathematics is one of the best examples, since the organization of this subject has been so definite and so fixed for many years. Superintendent Morrison discusses the needed readjustments very concretely, but at the same time in close relation to the fundamental principles that should determine the selection and arrangement of the material of any subject. Hence his paper will prove of interest not only to teachers of mathematics but to teachers of all subjects as well.

The desirability of substituting supervised study during school hours for home study is being urged by many parents and administrators and in the public press. Some school systems such as that of Sacramento, California, have achieved reforms along this line upon a very broad scale, but in many other places teachers are entirely ignorant of the possibility of instituting such reforms. Mr. Breslich, in his paper, presents the fundamental principles at the basis of the movement for supervised study and a review of the experiments that have been tried in various parts of the country.

Many reforms in instruction, however, cannot be undertaken successfully in some places owing to the quality of the teaching staff, their tenure of office, and the number of subjects which they are required to teach. Optimistic educational theorists and reformers often overlook

these limitations. The first step in the direction of improved conditions among the teaching staff must be based upon a clear understanding of the actually existing conditions. The paper by Professors Jessup and Coffman presents important information for this purpose.

# I. RECONSTRUCTED MATHEMATICS IN THE HIGH SCHOOL

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## THE ADAPTATION OF INSTRUCTION TO THE NEEDS, INTERESTS, AND CAPACITIES OF STUDENTS

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HENRY C. MORRISON

Superintendent of Public Instruction for New Hampshire, Concord, N.H.

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*General dissatisfaction with results of mathematical instruction.*—Few are satisfied with the present mathematics situation in the high school, particularly in the first two years of the high school. Dissatisfaction is found in the college faculties which deal with the product, among the mathematicians who are looking for a foundation for productive scholarship, among the teachers who are looking for something better; and dissatisfaction coupled with ridicule is found among the business men, engineers, and others, who expect mathematics learned in the school to function in the practical affairs of life. The purpose of this paper is an attempt to analyze the situation, to find out what is the matter with mathematics in the high school, and if possible to throw some light on the way out.

*Three factors involved: students, social needs, available subject-matter.*—Whatever the solution ultimately may be found to be, it can confidently be stated that the three chief factors of the problem to be solved here, as in the case of all other curriculum problems, are: (1) the pupil and the laws of his mental growth and development; (2) the social needs which the school as an institution must serve; and (3) the availability and use of the material under discussion—mathematics in this case—as an instrument for such pupil development and his adjustment to such and such social needs or purposes.

The existing mathematics of the high school, and particularly that of the first two years, however taught, falls far short of satisfying the known laws of adolescent growth, and it bears little relation to any known social needs. Referring to existing mathematics, the writer of course has in mind first of all the formal algebra and geometry usually found

in the first and second high-school years; and to these courses may be added the solid geometry, trigonometry, and advanced algebra commonly taught in the last two years.

#### I. THE STUDENTS, THEIR NEEDS, INTERESTS, AND CAPACITIES

*Subject-matter must function throughout the process of learning.*—The fact, or rather set of facts, at the bottom of the whole matter is the pupil himself, and he is the most stubborn fact of all. Everything must conform to his nature, whatever that may be. You may teach him much or little, but what you really teach will depend entirely upon what he can and will learn. For centuries untold schoolmasters have had their minds centered chiefly upon what they have thought he ought to learn and know, and seldom upon the discovery of principles which would reveal to them what he could and would learn. Now nothing is more deceptive than the appearance of learning which the average youth can present. It is possible to give the simulacrum of learning to almost any curriculum material from the multiplication table to Sanskrit. It is simple enough, that is to say, to cram a youth with learning which will enable him creditably to pass off a recitation or an entrance examination. That depends upon the force and skill of the teacher. But to ground the pupil in learning which will react to the only real test, namely, “will it function?” depends as much upon the nature of the pupil’s mind and the stage of his development as upon the professional tact and skill of the instructor. Whatever the subject taught or the teaching, if it is to be in any way productive and worth the while, it must not only respond to the function test, but it must have a chance to function all the way through the process of learning. That is, as it seems to the writer, indubitable in the light of all we know of the educative process.

*Present mathematics cannot function even in hands of skilled teachers.*—Now here is the first real trouble with the mathematics of the high school. It not only does not function in the hands of the poor teacher but it cannot function even in the hands of the skilled teacher. That is to say, there is nothing to which most processes in algebra or geometry, or indeed arithmetic, can be applied except to more algebra or arithmetic. Hence, while the pupil may for the time being attain perfect marks, his learning becomes no part of his stock of usable ideas, and he straightway forgets all about it until he is put through a naïve “review,” which in

its turn needs to be "reviewed" when he becomes a college Freshman or enters a shop. The first conclusion then is that we must find a kind of mathematics material not only which will function but which does function in some other field than mathematics while it is being taught, and such use must further respond to a real need felt as such at the time by the pupil. So only can mathematical concepts become realized.

*Disciplinary argument not sufficient justification.*—The objection will of course be made that mathematics is a "splendid mental discipline." Well, so is sawing wood or playing good football. Unless we can find some other justification for courses in the high school, many of them will undoubtedly presently travel the road of Greek, and we shall have little that can be called education left. It probably is not necessary to argue the disciplinary question. Suffice it to say that the algebra and geometry of the standard mathematics curriculum of the day represent the mental discipline conception of the educative process at its best. If they cannot justify their existence on the ground of their fruits, then the disciplinarians have much to explain.

It is fairly to be assumed at this day of the world that unless a course can justify itself as offering to the pupil a system of ideas which help to interpret to him his environment and enable him to react to new and strange situations in that environment, then such a course has little place in a modern educational institution.

But laying aside the purely disciplinary argument in its extreme form, it may be objected, with reference to geometry especially, that here is a method of thought in which the educated man should be trained. The contention might be granted in part if the thinking of the modern world were done in the form of the syllogism and in mathematical terms as was once the case. The fact is that the thinking of the modern world is done mainly in inductive form and in terms derived from biology.

*Mental characteristics of adolescent students.*—Let us return to the pupil and find out what we know about him. Little enough in scientific form, no doubt. But still an immense amount of information as to his habitual works and ways is fairly well made out. We owe a great debt to the noble army of child students led by the veteran Stanley Hall.

In the first place, this youth when he comes to the high school is, and has been for about two years on the average, an adolescent. If a boy, he is a clumsy, awkward chap, who has lost all the nimbleness and agility which he had three or four years ago, and is now chiefly occupied



physically in keeping from "falling over himself" and in keeping out of sight. Mentally his mind is dreaming and seeing things never dreamed of before. If a girl, well a mere man had perhaps best not try to do justice to her. Probably, in her own way she is at bottom in the same state as the boy, though she can laugh, or at least giggle, it off, while he cannot.

*Adolescence not a period for formal drill.*—Without attempting any lengthy analysis of the adolescent period, or yielding to the temptation to enlarge upon its marvelous beauties and possibilities, one conspicuous and enormously important and indubitable fact stands out: it is the worst period between the shedding of the milk teeth and the grave for anything like drill. It is a period when new ideas, especially those of a general spiritual type, are entering the opening mind in hosts of new forms; when the physical organism is undergoing a process of complete reorganization and readjustment; and when mental attitudes and powers are undergoing a similar and corresponding change. In these days, Nature cries out to the schoolmaster with his "character-building" schemes: "Hands off; this is my job; wait." Nothing could be less suitable to this youth's nature than the Latin beginner's book and the algebra and the formalized literary analysis with which the modern schoolmarm, just out of college, but yet ten thousand years older than the youth, greets him. The wonder is not that "elimination" takes place at a frightful rate at the beginning and during the first year of high school, but rather that anybody goes to high school at all.

*Adolescent student can grasp mathematical concepts.*—Now it does not at all follow that the adolescent boy or girl is incapable of mathematical concepts, or necessarily finds them distasteful. As has been pointed out above, a prominent characteristic of the mental attitude of the adolescent is an openness to entirely new types of ideas as well as an entirely new set of reactions. It is very likely true that there is in the adolescent mind a capacity for apprehending new mathematical concepts of a much higher order than has generally been thought possible. Nor is it to be reasoned that the youthful mind is romantic—vague term—while mathematics is deadly unromantic, and therefore boy and bud alike will have none of it. Nor is the mind at this or any other age to be viewed after the utterly false analogy of a muscular organ which is weak in childhood but grows stronger in youth and powerful in maturity, and thus becomes capable of grasping ideas by sheer force



of a sort of energy only in the prime of life. Rather does it seem to be true that the ability of the mind to apprehend new ideas is related to the ideas already actually in mind, and the ability to assimilate new notions and make them a part of the intellectual capital is largely a question of opportunities for such ideas to function in the interpretation of some feature of the environment. There is, for instance, nothing in the nature of the case to prevent the adolescent from apprehending and assimilating the concepts of the calculus.

The difficulty with the present high-school mathematics, especially algebra, is not in the intrinsically abstruse character of the concepts, but rather (1) in the extreme difficulty of finding an opportunity for them to function, and (2) in the fact that the algebra as taught is almost entirely an organizing and drill subject.

*But the concepts must be brought within the range of his experience.*—You have here a pupil whose whole life is in a state of profound change, in whom a habit established today tends to break up tomorrow, and you start out to organize a set of experiences which he has never had. You have a being who represents, phylogenetically, a superman as compared with what he himself was a year or two years since—a prodigious leap which represents perhaps the cultural evolution between the stage attained by the Iroquois and that reached by the earlier Greeks. It isn't that he is not capable of a high order of thinking; he simply hasn't had the experience with which to do his thinking. He is eager and anxious for new ideas; he never will be more so; but he cannot effectively formulate ideas which form no assimilated part of his intellectual equipment. The same boy will perform marvels of wireless telegraphy the understanding of which he has gathered from his juvenile periodical, but he will gaze stupidly at his science teacher who talks to him of the elementary units of electricity, and ultimately fail in his examination. Five years more of normal growth and that same formalized physics will interest him a great deal more than the construction of electrical apparatus.

*Fundamental attitudes of girls even less favorable for abstract mathematics.*—Before leaving this part of the discussion, attention ought to be drawn to the girl side of the question. Not only will the general statement of the case apply to the girl as well as to the boy, but there are further special considerations to be urged in her case. The programs of most existing schools have been evolved in a line-descent from the

earlier boys' schools, and it is only recently that programs have begun to show a special adaptation to the proper education of girls. Indeed, the protagonists of equal educational rights for the sexes have often in the past rather resented any teaching for girls different from that for boys, no doubt deeming it their primary duty to demonstrate that women could compete with men successfully on their own ground. And of course they have amply succeeded and more than succeeded. But in our analysis of the difficulty which seems to exist in the present mathematics situation, there are important special features true in the case of girls which are not true in the case of boys. Whatever is true of the mental attitude of adolescents in general to mathematical culture, it is also true that boys are normally organized to react favorably to the functions of which mathematics must become one of the chief instruments of interpretation. The man in brief is normally organized through bodily and mental development and inheritance to deal with the outward material environment, and for that purpose in civilized life he must rely largely if not mainly upon mathematics in some form. In brief, his attitude sooner or later is one of practical and normal interest. The woman on the other hand is organized both bodily and mentally for dealing with an entirely different set of functions, in which mathematics plays a small part. At this particular period she must be full of new ideas and insights totally different from those which are coming to the boy of the same age. In the nature of the case her fundamental attitude must be different and relatively less favorable even than that of the adolescent boy to the formalized mathematics of the early secondary school. His attitude doubtless is "I don't see the object of all this, but I can see that I am likely to have to learn it," while hers would conceivably be expressed thus, "This is evidently a part of education and of course it is my duty to learn it, but I hate it just the same."

## II. THE SOCIAL NEEDS WHICH HIGH SCHOOLS MUST MEET

*High schools being rapidly reorganized to adapt to changing social needs.*—Ordinarily, we might at this point proceed to the mathematics side of the question at once and scrutinize the essential function and purpose of mathematics in the educative process. We cannot do that for we are obliged to consider what kind of an institution it is for which we are studying program material. And the high school is conspicuously the institution in the whole course of education which is today in an unsettled state. The ancient landmarks have been torn up and the

boundaries are in process of revision. Whether rightly or wrongly, justifiably or otherwise, that is the case. Clearly it makes all the difference in the world in our view of the mathematics situation, or that of any other part of secondary curriculum, what view we take of the essential purpose and function of the high school as an educational institution.

*High schools becoming institutions for all the people.*—Conditions have changed. A generation ago the high school was an institution which few pupils reached. Life was relatively simple and the common school education was felt to suffice for the great majority. But since the eighties of the last century high-school enrolment has been outrunning population in growth all over the United States. A relative increase of five, seven, even ten times over the growth of population for twenty years has not been uncommon. Over a large extent of country, outside of the great metropolitan centers with their special problems, we have reached a stage where the high-school enrolment is often considerably in excess of half the maximum possible and, as has often been pointed out, this phenomenon is not peculiar to the United States. Now this fact points unerringly to the conclusion that the expression "common school" must be extended and applied to the secondary school. Indeed, in several of the states, it is hard to distinguish, on the face of the attendance returns, where the elementary school leaves off and the secondary school begins. Pupils do indeed drop out of school all along the line, but the loss is often quite as conspicuous between the fourth and fifth grades, or between the fifth and sixth, as between the elementary school and the high school; and the loss between the first and second high-school years is often more pronounced relatively than anywhere else. So the high school is rapidly becoming on the whole not the "people's college," but a part of the educational scheme common to all.

*These social changes affect curriculum and methods.*—Now these changes have altered greatly both the curriculum problem and the pedagogical problem in the high school. The former because the purpose and social function of the school has necessarily changed with the change in its clientèle; and the latter because the faculty has no longer to deal with a selected high-grade home background, but with a heterogeneous mass from every sort of social stratum.

*Differentiation now should fall at beginning of adolescences; not at end of compulsory period.*—The first significant principle which stands out clearly is the necessity for placing at a lower level the line of cleavage

between the elementary and the secondary school, between the pedagogy applicable to children and the pedagogy applicable to youth. The still prevalent eighth-ninth grade division point is probably related to a process of evolution which had gradually brought about a completion of eight years of work at the average age of fourteen, when by common agreement in most states the age of compulsory education has ended. With the rapid increase in the proportion of children passing over into the high school has come a curiosity as to why the first eight grades should be in the elementary school and the last four in the high school. Twenty years ago the Committee of Ten foreshadowed what is rapidly coming to be seen to be a fundamental principle, namely, that the division point should come at the dawn of adolescence rather than at its most critical point. Returns seem to indicate the thirteenth year in boys and the twelfth year in girls as good working approximations of the dawn of the adolescent changes. This corresponds very well to a division point between the sixth and seventh grades, which teachers have for a long time suspected to be the right one.

The changes above referred to, the rapid development of the present phase of society, and the increase of learning bearing upon the whole educative process, have together made necessary a careful re-examination of the whole theory of the purpose of the secondary school as a social institution.

*Detailed, concrete aims, related to social needs, must replace formal aims.*—We may note in the first place that no longer will vague phrases about mental discipline and character-building answer the question. Like the patriotic fervor of the average party platform, they sound well, but like party promises they are hard to carry out. The trouble is they don't mean the same thing to any two persons. Nor will such expressions as "a liberal education," or "education for citizenship," or that more recent and reverend teachers' convention title, "education for service," throw much light on the kind of mathematics we ought to teach.

The plain fact is that every school in every age has been at bottom an attempt to adjust its pupils to the requirements of the society in which they live. If we were still in the age of chivalry, we should probably find the school of the esquire a first-rate secondary school. If society in America were aristocratic, with a landed nobility based upon primogeniture, the problem would be simple. Existing secondary schools could be named by the reader which are very well adapted indeed to



furnishing the adjustment needed by such a society. But that is not what the democratic society of the day, organized on an industrial basis, calls for; and the state as the will of society simply and ruthlessly overrides the disputations of the doctors and bids us get back to the original purpose of the school, namely, getting pupils ready to live effectively in our own twentieth century United States—not in the eighteenth century, nor in Germany.

*Cultural course related to contemporary needs will continue to be prominent.*—Now there are two natural curriculum responses to the social adjustment theory of the high school. Your curriculum may still be strictly educative or developmental, or it may be technical with a view to immediate special training for life-work or vocation. Probably both types of school for youth above the age of about twelve will necessarily be a part of the general educational scheme for many years to come, though with the steady growth in the present trend of enrolment and with the amelioration of industrial conditions there is probably little doubt that cultural education will claim a steadily increasing majority of pupils, over technical education, up to the age of eighteen and beyond. Even now, it is a striking and significant fact that most investigations of the causes of dropping out of school do not reveal economic reasons but rather lack of interest on the part of the pupil as the real cause. Here, as so often elsewhere, popular guesswork is very much at fault.

*Mathematical courses should be differentiated for cultural and technical purposes.*—In any case the new cultural high school and the technical high school demand on principle very different mathematical material from that which the present high school offers on the basis of the disciplinary conception of the educative process.

The solution on the side of the technical high school should in principle be very simple, to wit: the thorough teaching of such processes as are needed in the industry for which training is given followed by drill to the point of efficient functioning within a narrow range.

But because, as it seems to me the facts indicate, the cultural high school is now, and will increasingly continue to be, the type of secondary school which the American school man will have to administer and in which the majority of our secondary teachers will work, I shall deal with that type only.

*Development of adaptability in adolescents is the aim.*—Now the kernel of the theory upon which the school will be administered is the development of adaptability in adolescents, according to the laws of their mental

growth. A great deal might be said upon the subject of adaptability as the greatest need of the industrial world, but I will refrain. At all events, we have here the central characteristic of the educable being, for adaptability is the standard by which all mental development above the level of tropism is to be measured.

To be more concrete, I mean that the modern American high school must produce a young man or young woman, not necessarily with specific training, but capable of intelligent adaptation in any situation in which he or she is likely to be placed. Let it be pointed out that the tragedies of modern vocational life lie, not so much in the fact that men are possessed of no special skill, as in the fact that rapid industrial changes mangle the careers of thousands who can do but one thing. As Henderson has so well said, we do not need to put industry into education half so much as we need to put education into industry. Be it remembered that adaptability and skill are exactly as much reciprocal terms in psychology as are power and speed in mechanics.

Again, lest we forget, let it be observed that the developed capacity of the individual to react to a strange situation is a question of his possessing a working system of ideas, and not of his having exercised interminably a mythical mental faculty.

*Some elements of knowledge common to all zones of adaptability; others less common.*—Now, it is perfectly clear that no one high-school pupil can be put in possession of all existing learning, or even of the elements thereof, as the above statement would seem to imply. Certain elements are common needs of everybody, for instance, knowledge of the human body, the heritage of the race in various institutions and a racial literature, in art, in ethics, and so on. Some elements are common to two or more zones of adaptability, as, for instance, the biological sciences to the housekeeper and the agriculturist. But the specific elements which go into an understanding of the fundamental problems of the homemaker are widely different from those needed in the educational equipment of the engineer or the attorney.

*High school must discover broad zones for special talents of individuals.*—Parallel with the fact that it is doubtless impossible to cover the whole range of learning in the high school, and as a consequence to attain an adaptability to any possible situation in life, is the further fact that it is undesirable by reason of the developing individuality of the adolescent. One of the chief functions of the secondary school is and must necessarily

be the furnishing of opportunity for a selective process to take place upon the native bent of a pupil, to discover to each so far as possible the broad zone within which his future activity will normally lie. Here is a specific difference between the elementary school and the secondary, for the child differs from youth in point of individuation fully as much as practice has sanctioned a difference in method between schools of the two grades named.

Children are not all alike, but different boys of ten are vastly more alike than are the same boys at the age of sixteen or seventeen. Children differ, but they differ in respect to bodily health, temperament, natural endowment, etc.; while adolescents begin to differ as adults differ not only in these respects, but much more markedly in point of interest in and natural adaptation to different types of activity. Children are as much alike as a horde of savages; adolescents begin to be as different as civilized men.

*High-school curricula should be differentiated to parallel broad zones of adult activity.*—Programs in high schools have for twenty years been prevailingly made up of curricula which differ from each other only in relative emphasis laid upon different phases of the same science-arts round of work. It is becoming increasingly clear that every high school should somewhat sharply differentiate its curricula along the lines of the broadest zones of adult activity. In the larger cities this division has already been foreshadowed by the erection of distinct types of high schools, to wit: the classical high school, the high school of commerce, the mechanic arts high school, and latterly the domestic arts high school. Similarly there has recently been developed in rural communities the agricultural high school. Clearly the pathway of evolution is plainly blazed out. We may go further and some time develop other high schools, as, for instance, in some parts of the East and South, high schools of the textile arts. Doubtless there will be many abortive attempts to include within the field of the high school industrial activities which are incapable of educational use, for many industries have already become so highly mechanized as to possess but little thought content for the worker.

*Chief zones and resulting curricula.*—There then is a picture of the well-developed program of today in a high school, enrolling say 250 pupils, and located in the typical community of say 10,000 people with industrial interests ranging all the way from a zone of farms a few miles

out to several highly developed industries in town. Such a school should offer well-differentiated curricula calculated to furnish the educational foundations for: (a) homemaking and housekeeping; (b) agriculture; (c) mechanical and engineering pursuits; (d) commerce; and (e) the professions through its college preparatory curriculum probably reorganized somewhat in both content and method.

In the large city, these different curricula will probably be as now independent schools. In the smaller communities probably a selection will more and more be made adapted to the chief industrial activity. In these different curricula, the mathematics and the science taught will need to differ greatly and they properly should.

*Appropriate mathematics for each of these curricula.*—Whatever mathematics is taught, be it remembered, must be only such as will be capable of functioning in enabling the pupil to interpret new situations as they are presented to his understanding, and which as a matter of fact does constantly so function in the learning process. We have been so long accustomed to the degradation of mathematics to the plane of a scourge calculated to mortify the spirit, if not the flesh, that it is still hard for many of us to accept fully the new point of view.

For the girl engaged in acquiring the educational foundation for her normal life-work, but little mathematics beyond the simple arithmetical computations which she has brought with her from the elementary schools will be needed.

The mathematics of the educated farmer is, first, a good deal of practical arithmetic, but not involving any very abstruse processes; second, a good conception of the properties of plane and solid figures; third, plane trigonometry and surveying. All of these the student will use in his studies and of them he will make frequent use in his vocation.

In commerce, arithmetic and certain of the processes of algebra applied to the solution of practical commercial problems will be needed.

In the mechanic arts there is an extremely interesting field for much more mathematics than we now commonly find in the secondary school. Arithmetic enough the boy already has. He needs algebra enough to understand more useful processes, and will use constantly a considerable range of constructional geometry. But more than that, his work will give him a concrete basis for trigonometry and the elements of calculus, the latter a perfectly feasible high-school subject when taught in connec-



tion with other studies and with shop work in which it has a constant opportunity to function, as I shall attempt to show later.

The mathematics of the college-preparatory curriculum will of course relate itself to mathematics in the college, until colleges conclude to relate their mathematics to what can be done in the preparatory school.

*Special provision may be made for brilliant students of mathematics.*—The question not unnaturally suggests itself, what place is there in the secondary school for the "born mathematician," for the youth who possesses a native bent for mathematics, and who ought eventually to become a teacher of the higher ranges of the subject and a productive scholar? It must be remembered that here, as in similar cases in other branches of learning, we are dealing with extremely rare instances. Probably, from 1 to  $1\frac{1}{2}$  per cent of all high-school students, take them as they come, have some incipient talent of this type. They are the geniuses of their generation, and no man has yet formulated the psychology of the genius. The trouble with most high-school mathematics courses is that they have been laid out on the theory that all pupils are variations or mutants or geniuses of this type. It is not, nor can it well be, sound public policy to adjust the school to the needs of these special types, any more than to the corresponding variations from normal at the other end of the scale. Probably all large high schools, say those enrolling 500 or more, should provide special courses for divisions of these people permitting them in every way to fulfil their bent. In other smaller schools, it is a pretty poor teacher who will not gladly put in extra time with these brilliant minds.

There remain two other considerations related to the social purpose of the school as an institution which must be considered.

*Moral purposes.*—The first of these is the moral purpose of the school. Mathematics particularly has been thought to have a special moral or quasi-moral purpose in the school on account of its excellent adaptation to disciplinary ends. The question then arises, in this analysis of the secondary school of the day, or at least of the immediate future, have you found any place for character-building?

*Mathematics as such can contribute little to moral training.*—The answer is, I think, that essential morality is a question of the relations of individuals in society, and that all we mean by moral education is the adjustment of the pupil to the standards of life in society sanctioned by the highest social ideals of his time. And this is not a matter of book

learning, but rather arises, if it arises at all, from the interaction of the various personalities composing the school, especially of course from the reactions of the pupil to the personality of his teachers. Now personality does shine through the pages of literature and of history and it is reflected in the fine arts, but in the very nature of the subject-matter mathematics is as devoid as possible of personality. The systematic and effective moralization of the pupil is of necessity largely, if not wholly, a question of the organization of the common life of the school—its athletics, its social intercourse, its public opinion and the means for the expression of its public opinion, its free intercourse between faculty and pupils and so on.

*Training in exact thinking through mathematics.*—One more precious feature of the mathematics of the secondary school, namely, the use of mathematics for “molding the mind of the pupil in exact methods of thinking.”

Of course this is the citadel of the disciplinary position. It has been, I think, amply demonstrated that the mind which has been molded to the method of mathematics will use that method in mathematics, and in thinking allied to mathematics, alone. The mathematician himself behaves in about the same manner as other mortals in a social or a political situation, but he reacts more efficiently in a certain type of scientific situation than does he who is devoid of mathematical training. The “method of mathematics” is a highly desirable asset to certain types of education, but the method will certainly not be acquired through a period of abstract study of algebra and geometry. It can only be acquired through the constant functioning of the mathematical processes learned, in the interpretation and solution of problems presented by other subjects.

### III. CRITICAL EVALUATION OF MATERIAL AVAILABLE IN MATHEMATICS

It has already been stated that in the analysis of any program problem presented by the school, three factors must be considered. First, the nature of the pupil must be known. Second, the general purpose of the school as a social institution must be investigated. Third, the availability of the material under discussion must be criticized.

Given a body of pupils in the adolescent period whose development proceeds according to natural law, the secondary school has as its function first to direct their several individual native abilities into the proper

broad zones of adult activity, and then to equip them with those organized systems of ideas which will enable them to interpret the new and strange situations in which they will be placed. The question then arises, what has mathematics to offer which is essential and valuable in this process?

*The use of mathematics as a tool in scientific thinking is most important.*—First of all, mathematics like language is in the main a “tool subject,” and not one possessing inherent value of its own. Language study would be of no consequence were there not literatures to be read, and thought to be expressed. Mathematics is of no value to us except as there are sciences to be studied. There are perhaps few better criteria of the trained mind than its distinguished ability to use mathematics as an instrument for the mastery of scientific truth. Indeed, it is claimed by many, as is well known, that a science is exact and of full stature as a science in proportion as it is capable of mathematical expression. The educated man endeavors to reduce all his important experiences with the material world to mathematical terms and thus to proceed confidently from step to step in his career. The uneducated man never knows exactly what his experience means, and proceeds by guess in the administration of his affairs, with great waste of energy and of substance and with a high percentage of failure.

We come then to the more definite criticism of the mathematical material of the secondary program.

*Differentiated courses needed to provide opportunities to use mathematics as a tool.*—In the first place, the traditional round of algebra, geometrical logic, advanced algebra, and trigonometry ought to be entirely abandoned and a fresh start made. The new work should relate itself directly to the specific needs of each of the new curricula, or of the new differentiated types of high school. That is to say, entirely different sets of mathematics material should be organized for domestic arts, for agriculture, for mechanic arts, for commerce, and for other new curricula or schools as they may be organized. Of these, by way of anticipation, it may be said that commerce and mechanic arts offer by far the best prospect for extended mathematical development. And let it be remembered that the essential justification for this step, from the mathematics standpoint, is that mathematics may have the chance to function as fast as it is learned. In each of these several schools, mathematical processes should be taught only as fast as they are needed,

but the need should be sought out and brought forward as well for the sake of the intellectual value of the subject under instruction as for the sake of the pedagogy of mathematics.

Throughout the program, the mathematics should probably be taught by the specialists in charge of the several specific subjects of the curriculum. In mechanic arts, for instance, the instructor who sets a project involving gear cutting should realize that the mathematics of the situation is as vital a part of his problem as is the mounting of the work on the machine.

To take up each curriculum in turn.

*Only arithmetic and mechanical drawing needed in domestic arts.*—In domestic arts, mathematics is needed to a greater or less extent in dressmaking, in the study of house construction and of the apparatus of the household, in household accounts and other economic courses, and in the study of food values. But the mathematics needed nowhere reaches beyond the elementary principles of arithmetic and a moderate amount of mechanical drawing. If algebra, geometry, and the higher mathematics are taught in addition, of what use are they? What justification of the energy and time consumed? Doubtless some of the girls will be able at the end to manipulate the concepts acquired more or less efficiently, but will such concepts interpret to them one iota which they do not understand equally well without?

*Geometry, trigonometry, and some algebra in agricultural courses.*—In the agricultural courses, boys will have to deal with materials and with facts which must be measured and recorded, and their measurements and records will at times become complicated beyond interpretation in simple arithmetical terms. In the measurement of their fields, in the laying-out of their highways and drains, in analyzing the strength of the different members of their buildings, in determining the profit of their different fields and domestic animals, they will need mathematics as a "tool" to enable them to read the situations presented to their intelligences. Then, what mathematics? Chiefly geometry and trigonometry and the art of making simple mathematical records and analyses; and out of these grows the need of some algebra.

*Geometry taught constructively.*—The geometry which the educated farmer needs is the "earth measurer," not a system of logic. He needs an understanding and knowledge of the properties of plane and perhaps solid figures learned in exactly the same manner in which he learns the



properties of soil in his soil physics. In the latter subject his instructor does not give him a limited number of axioms and devote the year to deducing the science from these primordial concepts. The geometry which is a study by constructive process with pencil and compass, with square and dividers, of the essential underlying principles of the science, is the geometry which will function and read out to the pupil the truths of which he feels the need. There is doubtless a philosophical beauty in realizing the awful necessity of geometrical truths, but our pupil may, if he be of philosophical turn, read logical geometry in the leisure moments of after-life along with his favorite theological speculations and accounts of the recent discoveries in Mars.

*Trigonometry.*—He will find a frequent use for trigonometry if he is to rise to the level of a truly educated farmer. He will use it later and he will use it now in acquiring the concepts of his schooldays. And trigonometry means both geometry and algebra. Geometry in the agricultural curriculum we have already discussed. The algebra needed, that is, the algebra which will function in this curriculum, centers around the equation.

The practical use of logarithms, not the theory, should probably be taught where they are first used, that is to say in the trigonometry course.

*Master use of the equation and subordinate processes.*—Now to acquire facility in the use of the equation means a very considerable amount of practice, but such practice should of course consist in throwing into the form of equations statements which it is desirable to have in such form, and not in the solution of puzzles in the form of "problems" totally unrelated to experience. The competent use of the equation of course implies facility in the use of a limited number of other algebraic processes, to wit: the elementary concepts of algebra, the four fundamental processes with the shorter forms of multiplication and division, the simpler cases of factoring, the extraction of the square root (but not the cube), and probably an acquaintance with the essential principles of expressions in radical form. This of course means the elimination for this curriculum of the following commonly found in texts in use in high-school courses: (1) all extended operations in complicated form such as are still found in exercise books; (2) the long processes for H.C.F. and L.C.M.; (3) all of factoring except the most common cases; (4) all of algebra as commonly treated beyond the quadratic. As before stated,

practice in putting statements in the form of the equation would be substituted for the usual exercises in the solution of problems. On the other hand, the principle implies, here as in the commercial and mechanic arts curricula, a much higher pedagogic efficiency than is often found in high schools in point of drill. That is to say, the laws of the acquisition of skill must be studied and applied to the development of what O'Shea calls automatic facility in execution. That is to say, if the pupil is to make himself master of the needed algebra for use as a language he must have acquired such facility in the use of the equation and the subordinate processes as to be able to use them naturally, and largely without thinking. For this purpose, there are numerous effective devices which will no doubt suggest themselves to the accomplished teacher.

*At what age should algebra and geometry be begun?*—The question suggests itself, at what point in the secondary period should the mathematics of this curriculum appear? This depends, I think, upon two considerations: first, the characteristics of behavior in the pupil at different stages in his development, and, second, the opportunity offered by curriculum or program exigencies for the learning acquired to function. Now certain phases of the mathematics to be acquired depend mainly upon the openness of the child's mind to the assimilation of new ideas, while others depend upon his fitness to acquire skill effectively and economically. Geometry is an illustration of the former; algebra, in the main, of the latter.

*Constructive geometry at about twelve; facility in algebra at about sixteen.*—There is probably little or nothing in the way of introducing the type of geometrical study which I have described at any time after about the twelfth year, but the earlier the better. In the case of algebra, the unsettled state of the pupil beginning with about the age of twelve, culminating at perhaps the age of fifteen and fading into relatively settled conditions from that time on, makes attempts to develop facility in execution very unpromising before, let us say, about the age of sixteen. Indeed, it would be entirely practicable to put most of the algebra back into the years between nine and twelve when conditions are much more favorable to the development of skill, were it not for the fact that there is no opportunity in those years for the algebra to function.

Trigonometry enters at an entirely suitable period as now at about the age of seventeen or say in the eleventh or twelfth grade.

*Provide constant practice in the mathematics of records.*—In the agricultural curriculum, and to a much greater extent in the commerce curriculum, is the opportunity and need of what may perhaps be called the mathematics of records. As pointed out before a characteristic difference between the educated and the uneducated man is the extent to which the former reduces his experiences to mathematical form, and reads their meaning in mathematical terms. Concretely, of course, we have here the courses in bookkeeping, though what is meant is very much broader than mere keeping of financial accounts. Such mathematics in this curriculum should probably be a constant practice in all courses rather than a distinct course by itself. The pupil should certainly be familiarized from the beginning of the secondary period with the practice of graphic expression and the reading of graphs.

*Commercial curriculum presents special problems and opportunities in securing educative content.*—The commercial curriculum which is chronologically the oldest of our modern importations of the practical arts or vocations into the program of the secondary school is still probably the least developed. For some reason it has not been easy to organize an educational content for commerce equivalent to those of the other curricula. Nevertheless, commerce offers an almost unlimited field for educational exploitation. Perhaps the statement may be ventured that from the educational viewpoint the mathematics of the commercial curriculum is mainly a matter of understanding and recording commercial transactions and interpreting their remoter consequences.

A curriculum in commerce definitely and seriously organized for any purpose more worthy than as a temporary abiding-place for pupils of small ability will certainly offer broad scope for much mathematics—for more of the higher mathematics as now taught probably than any of the other curricula. This becomes at once evident when we contemplate what is involved in the rational interpretation of statistics, in the records of complicated transactions, in the understanding of banking, currency, and kindred questions which must of necessity be matters of daily experience to every really educated business man—not merely the occasional financier, but every small trader as well who would conduct his business intelligently.

*Special aspects of commercial mathematics.*—The mathematics demanded by the situation and teachable in the secondary school appear to the writer to be at least the following: (1) the science of accounts;

(2) the principles of statistics; (3) the properties of number as set forth in the higher arithmetic and algebra.

*Science of accounts.*—The first of these we already have, in germ at least, in the high-school courses in bookkeeping, not nearly adequate for the purpose no doubt but still far from ridiculous. Indeed, bookkeeping in the hands of a competent teacher even now satisfies more of the requirements of the educative process than most high-school courses. It should be revised wherever necessary to make of it an efficient instrument for the recording of modern business transactions, and studied more as a body of principles than it now is.

*Principles of statistics.*—Of the second, little can be said except to urge upon the statisticians the importance and the opportunity of making their science a part of the general fund of learning. The helplessness of the average educated individual in the presence of a simple story told in statistical form must be a matter of common observation. The business man must read a very considerable part of his literature in statistical form.

*Higher arithmetic and algebra of business processes.*—To mention subjects like insurance, returns on investments, annuities, and similar considerations is to justify the need of the third kind of mathematics mentioned above, namely, the higher arithmetic and algebra or the study of the properties of number as such. Today the business man refers all such matters to the specialist, and his mental attitude toward them is the same as that of the average housekeeper to the plumbing of her home; and that is but one stage above the attitude of the savage in the presence of a thunderstorm. In other words, while the business man or the housekeeper may be an educated man or woman, neither he nor she is capable of an educated attitude toward work, unless work is fully understood.

*Mathematics in the curriculum in mechanic arts.*—All that has been said above is applicable in principle to the curriculum in mechanic arts or to the mathematics of the mechanic arts or manual-training high school. And the same may be said of any other industrial material which is capable of educational exploitation. In general, in any such curriculum, the extent of mathematics desirable or even possible will be closely related to the extent to which the subject-matter of the curriculum is susceptible of mathematical interpretation and expression.

One final study is perhaps here worth while, to wit: a brief survey



of the mathematics indicated for courses in the mechanic arts, for this curriculum certainly offers the broadest scope for mathematics teaching, though in the mind of the present writer commerce promises distinctly the greater intensiveness.

The mechanic arts curriculum ordinarily embraces: woodworking of a somewhat advanced type; forging; pattern-making; molding and casting; and general machine-shop practice with the engine lathe, drill press, bed planer, and milling machine. To these must be added mechanical drawing of a more advanced type than that found elsewhere. There should also be added courses less commonly found, namely, the elements of engineering as applied to the construction and management of steam, hot air, and various types of gas engines, and electrical machines and appliances.

*Geometry, plane trigonometry, analytic geometry, and calculus.*—Now the underlying mathematics which will interpret the subject-matter of this curriculum and which will function pedagogically during the teaching process and which is probably assimilable during the secondary period is the following: (1) geometry, plane, solid, and descriptive; (2) the elements of plane trigonometry; (3) the elements of analytic geometry and calculus. Of course as mathematical tools there must also be the modicum of algebra which is really needed for reading purposes; and acquaintance with the manipulation of such devices as the slide rule and logarithmic and other tables, but not necessarily any great facility in the use of these appliances.

*Bring in as applied mathematics where needed.*—The processes taught must be applied mathematics brought into the program at the point where it will be used and taught as a body of principles directed to a known and felt need and not as a logical system. The order of introduction should probably be: geometry and a great deal of it, then the necessary algebra, and finally so much of the higher mathematics as will suffice.

To a very considerable extent the educational level of the mechanic arts course will probably depend upon the degree to which the school succeeds in bringing mathematics to bear upon the study of the various operations involved, especially in the machine shop in the later courses of the curriculum.

A gas engine of excellent design and creditable workmanship and of effective accomplishment under working conditions may be and

frequently is produced. So far the pupil who constructed the mechanism has undoubtedly been developed, but his development has not reached the plane of genuine education unless his attitude toward his work and his product is different from that of the intelligent craftsman. He has been educated if he has thought out the process from step to step and hence understands his engine. But to understand that machine he must have been able to work out its construction and predict its behavior in mathematical terms and with mathematical exactness.

To use another illustration. A pupil can with the aid of certain tables, formulae, and similar devices work out and construct a cam which will actuate a certain device at a given point in its revolution. So far he is doing creditable work as a mechanic. But he is on the way to become an educated mechanic only when he has analyzed the situation mathematically without the aid of tables and formulae. When he has thus been enabled to really think out his work, he at once rises to an entirely new intellectual level.

*Reconstructed mathematics will save time and increase teaching efficiency.*—Of course all the foregoing involves administrative and pedagogical problems of a serious nature, but the problems once faced will be found far from insuperable. It is beyond the scope of this paper to enter either the administrative or the pedagogical field. Suffice it to say that when the problem is approached from the standpoint of analysis of the situation in a scientific spirit, much as has been the case with the scientific management people in the field of industry, a wonderful saving of time and a most fortunate enhancing of teaching efficiency is usually the result.

#### SUMMARY

The conclusions of this paper may be summarized in the following terms.

1. The traditional round of mathematics in the high school, to wit: elementary algebra, plane and solid geometry, trigonometry, and advanced algebra, must be revised both as to organization and content, and adapted to the known nature of the adolescent and to the social purpose of the high school as that purpose is increasingly revealed by modern conditions.

2. Mathematics must be treated primarily as a language, the purpose of which is the interpretation of the various sciences.

3. Courses in mathematics must be arranged at such points in the curriculum as will give immediate opportunity for functioning.

4. The several integral parts of the program such as the household arts, etc., must each have its own specially organized mathematics; and the mathematics of each curriculum should probably be in charge of the specialists of that curriculum rather than in the hands of a separate mathematics faculty.

# SUPERVISED STUDY AS A MEANS OF PROVIDING SUPPLEMENTARY INDIVIDUAL INSTRUCTION

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## *Main points of the paper.—*

1. In recent years the necessity of providing individual instruction to supplement class instruction has been emphasized. Another movement toward greater efficiency of our schools is the growing demand for giving pupils assistance while they are studying and training them in habits of study.

2. To attain both of these ends various plans have been proposed and tried out, one of the best being the provision of organized periods of study, for the purpose of supervising individual pupils who are studying silently.

3. This situation has developed historically according to the following stages:

a) Until the second quarter of the nineteenth century the dominant method of instruction used was the recitation by each pupil to the teacher at the latter's desk, of memorized lessons, often not understood by the pupils.

b) During the nineteenth century, group or class recitations replaced individual recitations in nearly all city schools.

c) Toward the end of the nineteenth century, the necessity of providing variations in instruction was urged in order to adapt instruction to the capacities of individuals.

d) The importance of this point is strengthened by the results of statistical investigations which show that in an ordinarily well-graded class the brightest pupil can do four or five times as much work as the slowest and often twice as much as the average pupil can do in the same time.

e) Home environment is a factor in the formation of study habits. Its influence may be either for good or for bad. The time spent by many pupils in home study is done under such unfavorable conditions as to form bad intellectual and moral habits and to waste an enormous amount of time.

4. During the last twenty-five years, experiments have been organized to provide for individual differences during class instruction. They include the following more important schemes, each having its advantages and disadvantages:

a) The abolition of all class recitation and home study and the substitution of supervised study. This is known as the Pueblo plan.

b) The organization of prescribed supervised study to supplement class instruction; known as the Batavia scheme. It has been tried in high schools in various forms.

5. The experiments which supplement class recitations in the high school with supervised study include the following types:

a) Supervision in the assembly room during the regular high-school study periods by the teacher in charge (Reavis' study program cards).

b) Attendance required of pupils who are falling behind during supplementary supervised study period (Detroit and University of Chicago High School).

c) Voluntary study hours in each department for pupils needing assistance, supervised by departmental teachers (Pittsburgh, De Kalb, and University of Chicago High School).

d) Use of double or divided periods, one part for supervised study, and one part for class recitation (Joliet, Illinois, and University High School, University of Missouri).

6. The general testimony concerning the efficiency of supervised study in improving the work of pupils is strongly favorable. That of Superintendent Hughes of Sacramento is an example from one of the largest systems which has abolished home study.

7. Exact measurements are needed before final conclusions can be reached. Three examples are furnished of measured superiority secured by supervised study in mathematics and history (University of Chicago High School, and the high schools of Bloomington and Oakland City, Indiana; Mr. Rickard's technique for conducting experiments).

8. A special technique for supervising study must be developed. This is easily done for mathematics, but not for many other subjects.

9. Until the high-school school day is prolonged to seven hours, it will probably be advisable to provide for some home study, especially for the brighter students.

### *Introduction.—*

One of the most pressing problems before the educational public at the present time is to find a means of eliminating the enormous waste of the time of pupils that results from two conditions which prevail in the schools, namely, the failure to provide for the individual differences in capacity found among pupils in the same class, and failure to organize the studying done by pupils so as to avoid the futile efforts which they now put forth to master lessons assigned for home work. One of the most important factors in solving both parts of this problem is the organization of periods for supervised study during school hours. The



chief purpose of this paper is to describe and evaluate the recent experimentation along this line. A brief discussion of the historical development of the present situation will be presented first as an aid in securing a proper perspective view of the whole problem.

*The first method of instruction was the individual method.—*

It is an interesting fact that the first method of instruction in the earliest schools was entirely individual and not class instruction. An examination of pictures of these schools brings this out very strikingly. They show that pupils were always taught as individuals and not in groups. The teacher remained at his desk and called upon his pupils one at a time to repeat the lesson, giving help or explanation whenever necessary.

How wasteful and unsatisfactory this method was can be understood from the testimony of men who received their education in these schools. Thus, Henry K. Oliver, describing the teaching in the Boston reading schools in 1800, says, "I received about twenty minutes of instruction each half-day, and as school was kept three hundred and sixty minutes daily, I had the privilege of forty minutes' worth of teaching and three hundred and twenty minutes' worth of sitting still, if I could, which I could not, playing, whispering, and generally wasting time, though occasionally a picture book relieved the dreary monotony."<sup>1</sup>

Peter Parley, born in 1793, who was educated in a rural school in Connecticut, describes the method as follows: "The children were called up one by one. . . . She [the teacher] then placed the spelling book before the pupil and with a penknife pointed, one by one, to the letters of the alphabet, saying, 'What's that?'"<sup>2</sup>

Even as late as 1855, Grimshaw, writing in *Barnard's Journal*, deplored the time wasted by the old-fashioned and false method of teaching individuals instead of classes. "I notice," he says, "in my visits to the schools, many pupils sitting idle; sometimes part of the school is asleep, or what is worse, making a noise and disturbing the remainder who desire to be industrious."<sup>3</sup>

Thus it is seen that in the early schools individual instruction was the common method used, although to some of the educators its waste-

<sup>1</sup> Parker, *History of Modern Elementary Education*, p. 83.

<sup>2</sup> *Ibid.*, p. 85.

<sup>3</sup> Holmes, *School Organization and the Individual Child*, p. 13.

fulness was apparent. The simultaneous or class method was adopted very slowly. "The individual method by which the master called his pupils to the desk one by one to recite their lessons and to receive explanations lingered late even in the heart of Prussia and in France it was in vogue as late as 1843 in 5,488 primary schools. In Scotland it held sway in some of the leading schools until well into the last quarter of the nineteenth century."<sup>1</sup>

*Exceptional examples of the early use of class instruction.—*

The method of grouping pupils into classes for simultaneous teaching under one instructor was described at length by Comenius (1592-1671) in his *Great Didactic*, published in Latin in 1657. In this book he gave a systematic presentation of his principles and methods. In the separate classes of his school he wants certain books introduced: "Out of these the teacher will read and reread the lesson for the hour, everyone listening to him. If anybody needs an explanation, he will explain it so clearly that it be impossible that they could fail to comprehend it. Then pupil after pupil rereads the lesson clearly and plainly, the others looking into their books and reading silently."<sup>2</sup>

It is probable that other reformers besides Comenius advocated and used the method of simultaneous instruction, but credit for its practical application on a large scale is due to the Frenchman, Jean Baptiste de la Salle (1651-1719). He organized the schools of the Christian Brethren, an association of Catholic laymen who were pledged to devote themselves to the instruction of the poor children. They used the class method of instruction.

The application of his method of class instruction is described in the *Conduct of the Christian Schools* as follows: "While one reads, all the other children in the class follow the words in their books. The master must watch carefully to see that all read to themselves what one is reading aloud, and from time to time, he must call upon some of them to read a few words that he may take them by surprise and make sure that they are really following the reading."<sup>3</sup>

The schools of the Christian Brethren who used this method of class instruction were without doubt the most effective elementary schools in existence before the French revolution (1789). However, in general

<sup>1</sup> Holmes, p. 12; Landon, *School Management*, p. 119.

<sup>2</sup> *Did. M.*, XXIX, 17, III.

<sup>3</sup> Parker, *op. cit.*, p. 100.

France seems to have clung much longer to the individual method of instruction than her neighbors.<sup>1</sup>

In England the individual method was replaced by the monitorial systems of elementary schools. This was due largely to the efforts of two men, Andrew Bell (1753-1832) and Joseph Lancaster (1778-1838). The monitorial system is a method of dividing the children of a school into groups which are taught by the more advanced and competent pupils. The method had been used by some educators before the time of Bell and Lancaster, but these two educators deserve the credit for perfecting it and for putting it into practice on a large scale. Lancaster had in his school in the Borough Road 1,000 boys. "For several hundred children there was but one master but he had for his assistants a picked company of the elder boys who looked up to him with reverence and rejoiced to carry out his plans. . . . Joseph Lancaster had the skill which gains the loyalty of subordinates, and he knew how to inspire his monitors with fondness for their work and with pride in the institution of which they formed a part."<sup>2</sup>

A defect of this system was the tendency to spend too much effort upon class organization and to overlook the individual. However, it brought about a radical improvement in the methods of school management.

*During the nineteenth century the individual method was replaced by the class method.—*

Being not only superior to the common methods of instruction in its effectiveness, but being also a very economical system, the monitorial form of the class method was adopted in the United States in 1806 by the Free School Society of New York City, and was used in other large cities during the first quarter of the nineteenth century.

The introduction of a system of instruction by which all pupils of a group are taught at the same time made it necessary to group children so as to make each group as nearly as possible uniform in ability so that the instruction would be best suited to their needs. A good classification made it possible to create for the child the best possible conditions for successful school work. This led to the "Graded System," or "Classroom System," the system of grouping together a number of children for

<sup>1</sup> Landon, p. 119.

<sup>2</sup> Fitch, *Educational Aims and Methods*, p. 334.



the purpose of instruction, the instruction being given to them as a group and by a trained teacher.

Dr. William T. Harris who deserves much credit for perfecting this plan says in a paper on "The Early Withdrawal of Pupils from School" (1872) with reference to the ungraded school: "The unclassified school has disappeared from our cities and large villages but still exists in the country districts very generally. Whenever the sizes of the schools have been such as to admit it, a system of classification has been introduced, and the immediate consequences have been (a) a great increase in the length of recitation; (b) far more thoroughness in the discussion of the lesson, sifting the different statements and probing the measuring of the same; (c) great stimulation of the mental activity of the pupil through trial and competition with other members of the class. These three advantages can scarcely be overestimated. They multiply the teacher's power just as organization improves the strength of the army."<sup>1</sup>

*Toward the end of the nineteenth century educators criticized the class method.—*

However, the defects of the graded system had become apparent and were keenly felt by Dr. Harris, as he says in the same paper: "It is this very system that is so organized as to prove the very greatest of all causes for the early withdrawal from school. . . . The tendency of all classification is to unite pupils of widely different attainments. The consequence is that a lesson is too short for some and too long for others. The best pupils in the class are not tried to the extent of their ability. . . . The poorest pupils of the class are strained to the utmost. They are dragged, as it were, over the ground without having time to digest it as they should. This develops the result that the overworked pupils are frequently discouraged and drop out of the class, and likely enough out of the school altogether."

Two years later (1874) E. E. White in a paper on "Problems in Graded School Management" criticized the graded system because of its serious defects: "If the teacher of a class adapt this instruction and requirements to the maximum capacity of his pupils, the great majority are hurried over their studies, and receive a superficial and imperfect training. If he adapts his class work to the minimum capacity of the class, the great majority are held back, and as a consequence, not only

<sup>1</sup> *Proceedings N.E.A.*, 1872, p. 266.

sacrifice time and opportunity, but fall into careless and indolent habits of study."<sup>1</sup>

*The importance of providing for individual differences becomes clear in view of statistical proof.—*

It is generally recognized that many children are not as able to succeed in their school work as the larger part of their class. Apparently, mass instruction under which abler children make normal progress is not efficient for backward children, for the principle that a subject is taught in the same way and to the same extent to every pupil fails to make allowance for the wide range of individual differences. Few persons, teachers included, know how great a variation in ability is found among pupils of the same class. Frederick G. Bonser<sup>2</sup> tested 757 children, 385 boys and 372 girls of the upper division of the fourth grade and of the fifth and sixth grades of public schools Nos. 2, 3, 4, 6, and 9, of Passaic, New Jersey. The tests employed were made up of a series of problems and questions designed to exercise the most fundamental four phases of reasoning activity, namely, the mathematical judgment, controlled association, selective judgment, and that complex of analytic and synthetic thinking used in the intellectual interpretation of literature. Table I gives the combined results of all of Bonser's tests. The table shows great variability within the various grades.

In grade 4 A the ability varies from 20 to 245 units.									
"	"	5 B	"	"	"	"	35	"	255 "
"	"	5 A	"	"	"	"	50	"	265 "
"	"	6 B	"	"	"	"	70	"	265 "
"	"	6 A	"	"	"	"	80	"	260 "

It is interesting to notice that a large number of 4 A pupils can do more than some of the pupils in the other grades.

Similar statistics are given by Thorndike.<sup>3</sup> In a test in addition given to 83 seventh-grade pupils, all pupils being allowed the same time, they did from 3 to 20 examples correctly.

The abilities of the fourth-grade girls in thinking of the opposites of words vary from 9 to 24; of fourth-grade boys in spelling from 20 to 99; of sixth-grade girls in observing misspelled words from 10 to 94; of

<sup>1</sup> *Proceedings N.E.A.*, 1874, pp. 266, 267.

<sup>2</sup> *The Reasoning Ability of Children of the Fourth, Fifth, and Sixth School Grades.*

<sup>3</sup> Thorndike, *Principles of Teaching*, chap. vi.

TABLE I  
FREQUENCY OF ABILITIES BY GRADES

ABILITY	GRADE 4 A		GRADE 5 B		GRADE 5 A		GRADE 6 B		GRADE 6 A	
	B	G	B	G	B	G	B	G	B	G
20 to 25.....		I								
25 " 30.....	2									
30 " 35.....	2	I								
35 " 40.....	3	I		I						
40 " 45.....	I	2								
45 " 50.....	2	I								
50 " 55.....		3	I		I					
55 " 60.....			I		I	I				
60 " 65.....	3		I			I				
65 " 70.....	4	I				I				
70 " 75.....	3	I		I	2			I		
75 " 80.....	3	I	I	I	I		I			
80 " 85.....	3			I						I
85 " 90.....	4	3	I	I						
90 " 95.....	5	2	I	I	2	2		I		I
95 " 100.....	3	5		I	2	I				
100 " 105.....	I	7		I	2					
105 " 110.....	5	2	3	I	3					
110 " 115.....	2	2	3	2		I	I			I
115 " 120.....	I	7	6	6	2	2	4			I
120 " 125.....	4	3	4	3	I	5	I			I
125 " 130.....	4	I	3	4	I	2	I	I		
130 " 135.....	3	5	3	8	5	2	I			
135 " 140.....	5	7	3	7			5	2		
140 " 145.....	4	9	2	4	2	5	2	I		I
145 " 150.....	4	3	I	4		I	2	3	I	I
150 " 155.....	2	3	5	6	6	I	4	I	2	I
155 " 160.....	3	4	4	3	I	2	2	5	I	I
160 " 165.....	I	5	4	3	4	2	2	2	I	
165 " 170.....	I	I	2	5	4	3	8	5	3	I
170 " 175.....	2	I	4	2	4	3	3	3	3	4
175 " 180.....	I	2	3	3	3	3	6	4	4	
180 " 185.....	I	I	4	3	I	2	4	7	3	3
185 " 190.....	I	I	I	4	2	3	5	5	I	3
190 " 195.....	I		3	3	2	2	4	3		2
195 " 200.....	2		4	2	5	2	6	6	3	3
200 " 205.....					3		4	4	3	5
205 " 210.....	2	I	3	2	I	5	7	4	I	2
210 " 215.....			3	2	2	2	5	5	3	5
215 " 220.....	2		I	I		I	2	4	2	3
220 " 225.....	I		I		I	I	I	3	I	6
225 " 230.....			I				3	2	4	2
230 " 235.....		I	I	I			2	3	4	I
235 " 240.....	I				I		I	3	2	7
240 " 245.....	I						2	I	4	
245 " 250.....							4		I	I
250 " 255.....			I				2		2	2
255 " 260.....							2	I	I	
260 " 265.....						2	I			

"Grade A" means upper; "Grade B" means lower.

The columns headed "B" and "G" represent "Boys" and "Girls" respectively.

eleven-year-old girls in addition from 5 to 44; of ten-year-old girls in rapidity of movement from 6 to 41 (number of crosses made in a fixed time); of twelve-year-old boys in observing letters from 28 to 71.

"The range of ability in school children of the same age (defectives not included)," says Thorndike, "is such that in a majority of capacities the most gifted child will in comparison with the least gifted child of the same age do over six times as much in the same time, or do the same amount with less than a sixth as many errors. The teacher of a class, even in a school graded as closely as is possible in large cities where two classes are provided in each building for each grade and where promotion occurs every six months, will find in the case of any kind of work some pupils who can do from two to five times as much in the same time or do the same amount from two to five times as well as some other pupil."

Mr. Search gives the following statistics on individual differences.<sup>1</sup> Members of Holyoke, Massachusetts, grammar school class of 24 pupils representing an ordinary well-graded class accomplished, in the same time, pieces of work in arithmetic varying from 140 to 479. In the Central High School of Pueblo, Colorado, pupils representing an average class in a graded school covered from forty to one hundred chapters in Caesar in the same amount of time when each pupil was permitted to advance at his own rate. In the Field High School of Leominster, Massachusetts, a senior class in review geometry showed a working ability ranging from 40 to 168 units of work.

In view of the fact of these individual differences, it becomes evident that the principle that a subject is to be taught in the same way and to the same extent to every pupil applies neither to the slow nor to the bright pupils. The bright pupil commonly has to be idle half of his time. The slow pupil is being hurried constantly. Not only does he fail to get clear understanding, meeting difficulties for which he is not prepared, but often because he needs more time than his classmates, he is being looked down upon by them. It is not surprising that he becomes discouraged, and failing in his work, drops out of school. Inability to understand the work and difficulties within the course are among the chief causes of failures. With some encouragement and individual attention, many pupils would be saved from failing. The large number

<sup>1</sup> P. W. Search, *An Ideal School*.

of failures in our high schools demands serious consideration on the part of every teacher.

C. R. Rands and H. B. Kingsbury<sup>1</sup> found recently that, in 46 high schools with an enrolment of 33,276 pupils studying English, only 81.44 per cent passed. In the same schools only 75.25 per cent of 24,404 pupils studying mathematics were able to receive credit.

A committee of the Chicago High School Teachers Club reports the statistics of failures in the Chicago high schools, as given in Table II.<sup>2</sup>

TABLE II

	NO. OF PUPILS		NO. FAILED		PERCENTAGE FAILED		AVERAGE PER CENT	PERCENTAGE FAILED IN	
	Boys	Girls	Boys	Girls	Boys	Girls		Eng.	Math.
First year.....	279	375	176	135	49	40	44.0	14.6	26.0
Second year.....	212	343	63	100	29.7	29.1	29.4	.....	.....
Third year.....	256	363	59	75	23.	20.7	21.7	.....	.....
Fourth year.....	224	313	44	32	19.6	10.2	14.1	.....	.....

The reasons for failure given by the pupils themselves are significant. One-tenth or more of the pupils who failed stated as the cause that the work was too hard, one-tenth say they were absent too much. One-fourth of those who failed in algebra said that they did not understand the work, and 50 per cent of the failing pupils in geometry said that they did not like the study.

Dr. Otis W. Caldwell reports the following statistics. Of 432 pupils who entered the Freshman class of one of our large high schools in the autumn of 1909, only 94 remained after the third semester, the other 338 having left school without completing the third semester. Of these 338 pupils, 124 made no passing grade in the school, 121 passed in only 57 per cent of the subjects which they took, and 93 passed in 78 per cent of their subjects making grades averaging above 80 per cent, the passing grade being 75 per cent. The 94 pupils who remained in school received credit in slightly more than 95 per cent of their subjects. "It seems possible that this case is more striking than would usually appear from such investigations since the problems associated with this particular

<sup>1</sup> *School Review*, November, 1913.

<sup>2</sup> *Educational Bi-monthly*, October, 1913.



school may be peculiarly difficult. In a careful study made by Mr. G. R. Johnson, of St. Louis, and covering records from twelve high schools with a total number of 18,926 pupils, he finds that approximately 90 per cent of those pupils who were failing in their work left school, while but 10 per cent of those who were making 90 per cent or better in their work left school. This percentage of those who failed and left school remains almost constant throughout the four years, with the exception that in the Chicago and Kansas City schools rather a larger percentage of the failures drop out in the earlier years than in the later years, while in the smaller schools the percentage of dropping out of those who fail remains about the same throughout the whole high-school course."<sup>1</sup>

*Reaction against home study and class recitation.—*

It is well known to parents and teachers that a very large percentage of children of our schools do not know how to study properly and profitably. When pupils are told by the teacher to study, they seem to do everything but the right thing with the result that much energy is dissipated and a great waste of time and effort is incurred.

Many teachers and parents depend upon assigned home work to develop the ability to study. It is argued that there is great value to the student in his unaided attempt to surmount difficulties; that he is gradually becoming independent by learning to read his books alone; that in the brooding of the pupil over the solution of a problem or some other assigned work the development of will power is realized; that it gives him an opportunity for quiet thinking which he cannot find in the classroom; that home work develops a habit of neatness not obtainable during the rapid progress of class work; that it is of greatest importance that the pupil should get further drill and review of the work done in the classroom; etc. In all of these arguments the great value that is claimed for home work is found in the ethical effect of being held responsible for a definite piece of work to be carried out independently and in the fundamental demand that the pupil must master it without help, using only his textbook and class notes.

There are also many teachers and parents who deny practically all of what has been mentioned in favor of home work. They claim that the notion that there is some value to the student in his unaided effort

<sup>1</sup> Dr. Otis W. Caldwell, "The Laboratory Method and High-School Efficiency," *Popular Science Monthly*, March, 1913.



to surmount difficulties is mistaken; that the effect of home study upon school progress is overestimated; that hasty and unmethodical use of books at home takes all the attractiveness out of them; that it means needless waste of undirected effort which might be replaced by much admirable and effective work; that it does not train, but weakens the pupil, since there is no more discouraging and nerve-destroying task than to be obliged daily to do mental work that has no meaning; that either pupils are being trained to evade duties and to use dishonest means of getting possession of the required work, or the mass of required work leads to cramming and mechanical memorizing and thus bars all spontaneous thought and activity, so that when the pupil gets through, he does not know much of anything.

Whatever may be the right view regarding home work, it is a fact that the great majority of the teaching public follows tradition rather than try new theories which in the end might be more advantageous. Therefore lessons are assigned regularly and most conscientiously, and since one of the great fears of a teacher is that of being unable to complete the requirements of the course within the limit of time, lessons covering advanced work are assigned only too often. It is very easy for the teacher to say to his class: "Study the next four pages for tomorrow; you will find some difficulties, but you are only expected to try seriously to overcome them." But the conscientious pupil will sit up late into the night neglecting his other work, spending hours fruitlessly because of his wrong viewpoint, being expected to do what was the proper function of the teacher to carry out. So it happens the *preparation* for the class work, not the class work itself, burdens the lives of the pupils.

An incident illustrating this fact is given in the *Ladies Home Journal* for January, 1913: A widow came to the superintendent of schools with the following complaint: "I have four little girls attending your schools. I am up at five o'clock in the morning to get them off to school and to get myself off to work. It is six o'clock in the evening when I reach home again, pretty well worn out, and after we have had dinner and have tidied up the house a bit it is eight o'clock. Then, tired as I am, I sit down and teach the little girls the lessons your teachers will hear them say over on the following day. Now, if it is all the same to you, it would be a great help and favor to me if you will have your teachers teach the lessons during the day, and then all I would have to do at night would be to hear them say them over."

That very few pupils have a clear knowledge of what is required in order to study and make their own a lesson as it is ordinarily assigned by the teacher is seen from the following experiment: Dr. Lida B. Earhart<sup>1</sup> assigned to 812 sixth- and seventh-grade pupils a short section from a textbook in geography with the following instruction: "Here is a lesson from a book such as you use in class. Do whatever you think you ought to do in studying this lesson thoroughly and then tell (write down) the different things you have done in studying it. Do not write anything else." It was found that 710 of these 812 pupils gave indefinite and unsatisfactory answers.

In a later test in which children were asked to find the subject assigned only 317 out of 828 were able to discover the most important part of the lesson. Yet determining the subject and the leading facts are among the principal topics needed for successful study of a lesson.

This shows that the greatest care on the part of the teacher in assigning the lesson is needed.

It is true that the better teachers give careful suggestions with each assignment as to method of attack, aim, and meaning of the assignment. Usually this enables the better pupil to do the work without undue difficulty, but it does not help the slow pupil who fails to make the connection between the assignment and the suggestions given by the teacher.

That in beginning classes of the high school suggestions given with the lesson are not sufficient to enable the pupil to do his work, and that the pupil's difficulty in studying his lesson is much greater than is usually assumed, is illustrated by the following occurrence: The parents of a pupil just beginning first-year mathematics in the University of Chicago High School complained to the teacher that the daughter came home day after day with home work assigned, but with no idea how to do it. The girl had told them it was the teacher's custom to assign problems with no suggestions. Feeling that this procedure was unreasonable, the parents spent the evening hours working the problems and explaining them to the child. When they were unable themselves to do the work they called on a ministerial friend living in the next block, who was good in mathematics and kind enough to help. Finally the parents came to the teacher and complained: "Sometimes even all of us cannot do the work you assign; how do you expect her to do it alone?" The teacher was surprised to learn that, after all the careful preparation in

<sup>1</sup> Strayer and Thorndike, *Educational Administration*, p. 240.

the classroom, a pupil, no matter how slow, should not even know that suggestions were given. Asked whether any suggestions for the next day's lesson were given, the girl said she knew of none. To satisfy the parents, the teacher took a quarter of a hour to go over the preparation of the lesson with the parents and daughter exactly as had been done in the classroom. It was found that the girl remembered it all, but failed to see how it would help her to study her lesson. It was now the parent's turn to be surprised. They went away feeling that the child, not the teacher, was at fault. But this experience shows clearly that the teacher's method of instruction did not accomplish the desired results, for at any rate this pupil had failed to make the connection between suggestions and assignment.

To ascertain to what extent the other members of the class might have this difficulty, the following experiment was tried. In assigning the next lesson, suggestions were given with unusual care. The pupils were then told that the next fifteen minutes would be given to studying the lesson, and that they should begin the assigned home work immediately. The experiment showed at once that the pupils did not appreciate the value of limited time, for all were slow in beginning work. It took some of them the whole fifteen minutes to go through the technique of getting started. Several evidently were not in the habit of working alone, for they looked about helplessly and simply imitated the others. However, these same pupils had come to the classroom daily with the lessons well prepared. Very little was accomplished in the fifteen minutes, indicating that the pupils very probably wasted much time in studying their assignments of home work. Although the class had been in the high school only a short time, the teacher had been presupposing a habit of study which did not exist. Much of the difficulty is due to lack of knowledge as to how to study and how to use time to advantage. The remedy in this case is, of course, definite instruction as to methods of study.

In the high schools one often hears a teacher require a class to study a given lesson, but seldom does one find a teacher much concerned about the method employed in satisfying this demand.

The need of teaching high-school pupils how to study becomes even more apparent when one considers the difference between the methods of the elementary and high school. Dr. Caldwell calls attention to this difference in his article in the *Popular Science Monthly*.

In the elementary schools from which these pupils have come to the high school, the school day runs from 8:30 or 9:00 to 3:30 or 4:00 o'clock and the greater part of all study is done during school hours, under direct or indirect supervision of the teacher. The teacher is present to correct any misunderstandings in assignments, to give a directing question or suggestion, or to quicken the endeavor, when such is needed. The work of one year is fairly well connected with that of the preceding years and partially new and partially old ground is covered each year. On the other hand, in the high school, particularly, in the first year, the subjects of study are largely or wholly new, often so new as to constitute fields quite unknown to the pupils. Even when some of the subjects are not new, we have a larger change than occurred between any two elementary grades. Pupils in a given subject go to the special room of the teacher for their recitations, recite, and receive their assignment, and then go to another classroom for another subject, or return to their assembly room or to their homes with their assigned work for the next day. The teacher in the elementary school ordinarily meets the pupils of a given grade for most or all of their work and knows them as they appear in all their work. In high school each teacher is especially interested in one or a few subjects and this one or few are the only ones in which the teacher knows his pupils. In the elementary schools the teacher usually stands as representative of one grade of pupils. In the high school the teacher usually stands as representative of a subject.

The conditions for home study present all the possible variations, but most home study must be done under discursive influences—a little study, a little conversation about irrelevant matter, an intermittent discontinuance for small household duties, a prolonged intermission for recreation, with the half-consciousness of wrong doing because of unfinished and overhanging lessons, even interrupted sleep because of a number of unfinished tasks, a final effort to secure categorically such facts regarding the assignment as are essential to enable the pupil to meet the teacher, a consciousness of incompleteness of preparation and a hope that, if called upon at all, the call may come for the facts that are in the pupil's meager store. Often the pupils' own initiative to home study must be supplemented by commands or entreaties from parents, and sometimes parents must do pupils' work for them, under penalty of family chagrin due to impending failure of the child. In most cases poor habits of study result from purported home study, though some pupils of good ability and strong individuality may do quite effective or superior work through home study. The habit of dawdling, waste of time in getting to work, wondering whether the work really must be done, whether a lexicon, cyclopedia, or parental answer to questions may not be found, leaves an entirely improper attitude toward real study. Sham work, at first as a makeshift, later becomes the only kind of which some individuals are capable.



William C. Reavis made an investigation as to the relation between the habits of study of a pupil and his home surroundings.

The investigation covered the home conditions of three hundred and ninety-three children. Data about these homes were gathered and graded according to the following points. Educational interest on the part of the parents, means to provide adequate food, clothing, medical attention, books, papers, magazines, and entertainment, moral atmosphere that would encourage honesty, earnest effort, regard for the right of others, and a due measure of self-respect. The homes were divided into three equal tertiles and designated as Rank I, II, and III. It was found that 75 per cent of pupils of home environment of Rank I, 32.4 per cent of Rank II, and 15.3 per cent of Rank III have habits of study of the first class; 19.7 per cent of Rank I, 48.2 per cent of Rank II, and 40.7 per cent of Rank III have habits of study of the second class; and 5.3 per cent of Rank I, 19.4 per cent of Rank II, and 44 per cent of Rank III have habits of study of the third class. The investigation shows that there is a marked correlation between the rank of the home environment and the habits of study of the pupil and points out the fact that the possible origin of many of the habits and attitudes of school children is in the home. Table III classifies pupils who do, or do not do, their home work assigned by teachers. It is seen that there is a large percentage of pupils doing home

TABLE III

	Rank I	Rank II	Rank III
Home study.....	38.5 per cent	54.2 per cent	7.3 per cent
No home study.....	4.1 " "	43.8 " "	52.1 " "

study coming from homes of the first and second rank and that there is a large percentage of pupils not doing home study coming from homes of the second and third rank.<sup>1</sup>

Thus, home study cannot be depended upon to develop the pupil's ability to study and it is left to the school to make the pupil able to work efficiently without help and to teach him to use his mind and his books, one of the most important lessons in the preparation for life.

However, the class system commonly in use in our high schools does not develop efficiently this ability. The class period is used partly for assigning home work and partly for recitation purposes. Usually this last part is the more prominent. Its purpose is primarily to determine

<sup>1</sup> Factors That Determine the Habits of Study of Grade Pupils," *Elementary School Teacher*, XII, 71-81.

whether a pupil can give a satisfactory account of the given topic which he was to prepare in his home study. Necessarily the recitation is largely devoted to clearing up difficulties. It gives usually little additional stimulus to pupils who have mastered the lessons and who therefore have little interest in the helpless efforts of their classmates trying to reproduce the assignment.

As a result the recitation as a test of a pupil's home preparation is likely to become monotonous, especially when a slow pupil recites; it encourages lack of attention and divided interest. It fails to rouse pupils to their actual capacity of effort. If, as happens frequently, the whole class period is given to recitation purposes the assigned home work is likely to be on advanced work to be followed the next day by another uninspired reproduction, etc.

This is the class system commonly in use in our high schools. It is wasteful of time and energy, productive of loss of interest, and not efficient in developing ability to study.

*Experiments to provide for individual differences during class period.—*

From the preceding review it is seen that both individual and class instruction fail to get the best results in school work. To go back to the individual method obviously would be a mistake, while under class instruction the variety of human nature is not recognized. It must choose those stimuli which are for the greatest good of the greatest number of those who are most deserving.

While the slow pupil is struggling with unnecessary difficulties, the bright pupil who, in the same time, can do four or five times as much work as the slowest in the class without making one-sixth as many errors is held back and is not profitably employed. He wastes time, may lose ambition, and finally become satisfied with little progress.

Thus mass instruction fails to provide for the very bright and for the very slow. The latter must either receive additional instruction or have provided for them a method which is more efficient for the individual than mass instruction.

Dissatisfied with the uniformity of classroom methods, parents, administrative officers, and teachers in schools of all grades have tried to develop methods which will be more effective for the individual pupils; which will provide for individual differences without losing the great advantage of the uniform method. A number of plans have been advo-



cated as being effective in providing for the varying needs of the pupils due to the differences between the bright and slow.

In the following, some of the more successful plans will be presented:

#### ABOLITION OF ALL RECITATIONS AND HOME STUDY

Perhaps the best known of the plans to provide for individual instruction is the so-called Pueblo plan which became generally known through the publications of Superintendent Search from 1894 to 1901.

##### *The individual, or Pueblo plan.*<sup>1</sup>—

The school day is divided into six one-hour periods. Four and one-half hours are devoted to language, science, mathematics, history, literature, and drawing. Three periods a day are definitely assigned to three literary studies carried on together. The additional one and one-half hour is regarded as extra time to be spent wherever the pupil needs it most, or in some cases according to his individual bent. In the high school a fixed program is followed. In the grades below the high school the work is entirely by flexible programs. The work is conducted largely by what is called the laboratory method, each teacher arranging a plan of work one week in advance. There is no recitation as it is generally conducted in schools. There is a class exercise for the presentation of fundamental principles in beginning a new subject, for the giving of working directions, or for the discussion of general principles applying to all individuals. Promotions are based entirely upon ability to do. There are no marks, no mechanical reward for doing right, no rankings or discriminating honors of any kind.

Various claims are made in favor of this plan by its advocates.

1. Better health: There are no excessive hours of labor. When a student leaves school, he turns the key on his school books and school-room work. His energies find expression through some other channel.

2. Trained, independent, self-reliant workers are produced. Since the pupil realizes that a lost hour cannot be made up by a later application, there is no passiveness or dead time to encourage wandering thought. All the work, being done under direction, is better done. Each pupil is the absolute maker of his own success.

3. More work is accomplished and the work is more thoroughly done. The experience of the school has shown that more is accomplished.

<sup>1</sup> *Proceedings N.E.A.*, 1895, pp. 398-405; Preston W. Search, *The Ideal School*, p. 250; *Educational Review*, February, 1894.

4. More enthusiasm in work: The opportunity for daily and continuous promotion is an immense stimulus and results in enthusiasm for work.

5. Less discouragement: The individual is appealed to because he is permitted to work in his own place and according to his own strength. Pupils who otherwise would be lost are held in school because at the beginning of the year each pupil starts just where his work the year before stopped.

6. No opportunity for additional and outside work: The demands of the school do not crowd to the wall the duties and relations of home, church, and social life.

The individual system was tried successfully<sup>1</sup> in Central High School, Pueblo, Colorado, in 1894, the Oakland (California) High School, the Los Angeles High School, the Holyoke High School, in 1900, the Field High School, Leominster, Massachusetts, in 1899, the Girls' High School, Boston, and the San Diego High School, of California, according to Mr. Search's account.

The Pueblo plan was tried later<sup>2</sup> by Mr. Gilbert B. Morrison, principal of the Kansas City (Missouri) Manual Training High School. The results reported by him were very favorable. Pupils who ordinarily would have failed were able to make creditable grades. Some pupils were able to finish a subject in less than the prescribed time. If there were strained relations between the teacher and pupil, they soon died out. The experiment was repeated later by Mr. Morrison in the McKinley High School in St. Louis with the same favorable results. Pupils were able to get a better grasp of the subject and the percentage of failures decreased considerably.

The plan has been criticized unfavorably because it fails to recognize the school as a social institution, in which members should work not only for themselves but also with and for others. The entire loss of the recitation is regretted, as it offers opportunity for competition that comes with group activity, which is eliminated by a system of individual instruction. Although skilled teachers may succeed with the system, it is difficult for the ordinary teacher to use the method successfully. It involves an enormous amount of mental bookkeeping on the part of the teacher.

<sup>1</sup> *The Ideal School*, pp. 252, 253.

<sup>2</sup> Swift, *Mind in the Making*, pp. 254, 255.

The last objection is so serious as to constitute the deciding argument against the plan in the minds of many skilled administrators. Thus, I. M. Allen, principal of the Kansas City High School, while investigating plans to provide for individual differences taught an algebra class using the Pueblo plan in order to determine its merits. It secured practically all the results claimed for it, but the difficulties involved in keeping in mind the work of 25 or 30 pupils at different stages of advancement and of making daily prescriptions for them taxed his memory, inventiveness, and skill to the utmost. Obviously the ordinary untrained teacher, found in an ordinary high school, would have even greater difficulties to direct five sections of 30 pupils each by this method.

#### ORGANIZATION OF PRESCRIBED SUPERVISED STUDY PERIODS SUPPLEMENTARY TO RECITATIONS

The following plan aims to combine the advantages of individual and of class instruction.

##### *The Batavia plan.*<sup>1</sup>—

The plan was accidentally discovered by John Kennedy, superintendent of schools, in Batavia, New York. It was the custom in his schools to divide overcrowded rooms. For some time Mr. Kennedy had been interested in individual instruction as a supplement to class recitation, and it occurred to him, rather than to divide a class, to put in an additional teacher to find the weaknesses of the pupils and to help them remove the difficulties that kept them from making normal progress. As one teacher conducted the class exercise in the usual manner, the other gave individual help to slow pupils in the studying group, making it possible for them to keep up with the bright pupils in the room. Encouraged and surprised by the favorable results, the plan was introduced into other classes with equally good results. It was therefore demonstrated that the success of the experiment was not due to the strong personality of any one good teacher, but that it worked with others.

The experiment was then varied so as to repeat it in small classes with one teacher and also in high-school classes. Half of the class period was devoted to individual instruction, the other half was left for recitation purposes. The results showed that the plan was as successful

<sup>1</sup> *Proceedings N.E.A.*, 1901, pp. 295-300.

in a one-teacher room as in a two-teacher room. The experiment has been repeated successfully in Westerly, Rhode Island, in the Kansas City High School, and in some schools in Minnesota.<sup>1</sup>

The following advantages are claimed for the Batavia system.

Slow pupils are helped without overpressure. Bright children are kept from marking time. Special relief is brought to teachers whose health is injured by the strain of too large classes. Under this plan there is no strain. Children (and parents) are relieved from overwork and worry, as children no longer come home with large amounts of back work to make up. Order and discipline are greatly improved. Very many apparently hopelessly dull pupils may be intellectualized. Because of the small number of failures, pupils are not withdrawing from school in as large numbers as formerly, causing a large increase in high-school attendance. The number of pupils going to college is increased correspondingly. Instead of producing dependence, as it might seem at first glance, it produced independence. Because of the individual instruction provided, it is easy for pupils to make up for losses due to absences. The per capita cost of education has been reduced since the introduction of the plan.<sup>2</sup>

Unfavorable criticism of the plan is to the effect that too much help given to a pupil will make him dependent upon the teacher. However, discretion on the part of the teacher may overcome that. It is also found difficult in a one-teacher class to keep bright pupils profitably employed when the slow members of the class receive the needed individual help. The application of the Batavia plan in the high school includes various types of adjustment which will be described below.

*Supervision of study during the regular high-school school day.—*

Home study being an important factor in the high school, it is necessary to organize the pupil's time and work so as to make him able to do the required home study and to supervise that study.

Wm. C. Reavis, Oakland City, Indiana, worked out a plan by which both of these aims were to be accomplished.<sup>3</sup> Each pupil had to make out on a printed card a definite program for the school day, stating

<sup>1</sup> Bagley, *Class Room Management*, p. 222.

<sup>2</sup> John Kennedy, "The Batavia Plan after Fourteen Years of Trial," *Elementary School Teacher*, June, 1912, pp. 449-62.

<sup>3</sup> "The Importance of a Study-Program for High-School Pupils," *School Review*, June, 1911, pp. 398-405.



the periods of study and of recitation. The teacher in charge of the study room had on file duplicate copies of these cards, making it possible for him to supervise closely the work of each pupil. Each pupil was urged to divide his time at home in a similar manner, thus arranging for regular study hours and the parents were asked to see that the program was carried out. This was done by the large majority of pupils. The study-program card contained ten suggestions for effective study. The following are claimed to be the results of the method:

1. The problem of discipline in the school was largely solved as each had a regular program to follow and there was no time or necessity for idleness.

2. Since certain subjects were specified for home study each day no time was lost by the pupil in trying to decide what he should study. This is especially valuable to the pupils who have not learned how to organize their time. It helps them to decide how much time they are to take for the preparation of each subject.

3. The pupils avoid the mistake of preparing several subjects in one period without preparing any of them thoroughly.

*Required supplementary study hours have been used by some schools to supervise the pupils' study.—*

Dr. Otis Caldwell in his article "The Laboratory Method" mentions the following experiment:

In the Detroit Central High School a different plan has been followed in some experiments in algebra and Latin. Principal David McKinzie writes: "We have experimented somewhat with a plan to give additional direction to the weaker pupils of the ninth grade. I cite two cases of first course in algebra and Latin. At the end of ten weeks all pupils who were marked failing in these subjects were grouped together for special work in addition to their regular recitation periods. They were given twenty lessons each on the ground covered during a period of six or seven weeks. Each pupil was treated as a pathological subject. In the final test they were marked as follows:

#### LATIN

Total number of pupils.....	15
Number marked "Excellent".....	1
Number marked "Good".....	6
Number marked "Fair".....	3
Number marked "Weak".....	1
Number marked "Not passed".....	3
Number marked "Left".....	1

## ALGEBRA

Total number of pupils . . . . .	20
Number marked "Excellent" . . . . .	2
Number marked "Good" . . . . .	4
Number marked "Fair" . . . . .	3
Number marked "Weak" . . . . .	5
Number marked "Not passed" . . . . .	3
Number marked "Left" . . . . .	3

It is plainly evident that a large number of ninth-grade pupils need greater direction than they receive at present, and I am convinced that we must resort to some plan to give them this additional help, if we are to eliminate excessive mortality in this grade.

In the year 1912-13 the Department of Mathematics of the University High School, at the University of Chicago, adopted the following plan of giving special attention to pupils who are likely to fail in the course or who wish to withdraw from the course because it is too difficult for them. The experiment was at first tried in first-year classes. In the first semester of the year 1911-12, ten first-year pupils failed, two were conditioned, and sixteen withdrew from the course before the close of the semester. In the following year, it seemed that this experience was likely to be repeated, as a few weeks after the beginning of the school year twenty pupils were not doing work of passing grade. It was hoped that with proper individual attention given early enough it might be possible to save some of these from failure and to keep them from withdrawing from the course. To give them this special attention in the classroom is not possible, and it is hardly fair to hold back a class for the sake of a few, if a different arrangement can be made. Therefore a special class was formed for those who could not keep above passing grade in their work. Pupils were registered for this class with the understanding that they were to return to the regular class as soon as they could do work above passing grade. Of the twenty regular members, five returned to their classes before the end of the semester. All of those were able to continue without help. In the final examination they received grades of 63, 65, 71, and 100, respectively (60 being the passing grade), one having left school before this time. Three pupils left school before the end of the semester and six of the remaining pupils failed. At the end of the school year this class had fourteen members. These pupils had covered and understood the year's work, but could not



remember it well enough to pass an examination. Some of them were apparently capable enough, but could be induced only at periods to do their best. Very little would have been gained by having these pupils repeat the course. Those who in the judgment of the teacher were worthy received credit for the course with the understanding that in case they wished to take up the second year's work, they would have to repeat the second half of the first year's course. This left four failures at the end of the second semester. These pupils must repeat the second half of the course, as a year's work in mathematics is required for graduation in the University of Chicago High School.

In the autumn of 1913 the number of failing pupils in Freshman mathematics was found to be very small. This is partly due to the change of classroom method brought about as the result of some experiments with supervised study to be described later in this paper. Although a special class was started in the expectation that the number of failing pupils might increase, it was discontinued after several weeks. The seven pupils failing in the first year's work are now allowed to remain with their classes, but are required to attend a special-study class organized for all pupils having difficulty in courses in mathematics given in the second, third, and fourth school years. Because of their small number it is possible in that study period to give to these seven pupils the needed individual attention. This arrangement makes it possible to give to the slow pupils no more attention during the regular class period than to the remainder of the class. Of the two plans just described, the preceding one was the more satisfactory. With no failure in any of the Freshman classes at any time during the year, the first-year course was completed more easily and with better results than ever before. On the other hand, most of the slow pupils were able to complete the year's work within the year's time with better results than are usually obtained by having them repeat the course.

For all pupils taking courses above the first year, a daily "study class" has been arranged. If a pupil is doing unsatisfactory work, i.e., below passing grade, he is requested to go to the study class in addition to his regular class. All absences from this study class are reported to the office and regulated by the office in exactly the same manner as absences in other classes. The time of the class is after school hours, at 3:00 P.M., and therefore not too convenient for the pupil, as it is likely to conflict with other appointments such as music lessons, dentist

appointments, etc. This serves as an incentive to a pupil to improve as rapidly as possible.

*Voluntary study hours in departments.—*

To give the benefit of this special class to the largest number possible, it was decided to urge pupils to attend if they were in danger of failing and needed instruction in addition to what they received in their classes. Those who failed to understand some particular lesson or had missed some work because of illness have the privilege of visiting the afternoon class and of asking questions at the proper time. A large number of pupils make use of this. It seems that this alone makes the undertaking worth while.

The study class is conducted as follows: As soon as the pupil has taken his seat, he begins to think about his lesson or, if no lesson is assigned, he finds review work. After the roll is taken (silently), the teacher passes from student to student, informing himself as to what pupils are doing, giving them help, suggestions, or whatever else is necessary to get them started on their work. Thus with twenty to twenty-five pupils in the room, the teacher is able to see each one three or four times in the hour. Some need very little help, others need several minutes each time.

It is surprising how rapidly some pupils improve who seem to have no habits of study when they come at first. At the present writing (tenth week), a number of pupils have improved enough in their regular class work to be excused by their teachers from further attendance during the study period. The fact that not only failures but often very good pupils are members of this class removes all feeling of disgrace so often attached to such classes. Parents have expressed themselves favorably about the plan, as doubtless it will do away with much of the private tutoring. Some parents regret that children are kept indoors at a time of the day when they should be outside, but are reconciled by the fact that the pupils are through with their home work or review work in mathematics, leaving them time for other things in the evening.

However, the pupil is not the only one who derives benefit from this study class. Without question the teacher learns much in working with slow pupils. The fact that more pupils fail in mathematics than in other subjects indicates either that teachers of mathematics are not as well prepared to teach their subjects as other teachers, which seems

unlikely, or that the subject itself is not as well adapted to the needs of the pupils. Without doubt the more teachers know of the difficulties boys and girls meet in a subject the better will they be able to shape a psychological course of study. The question might be raised concerning the possibility of more than one department in a school having a similar study period. This would require some administrative regulation, but there is no reason why it could not be satisfactorily arranged, especially for the few subjects in which individual assistance is most necessary.

*One required study period per week in each subject.—*

In the De Kalb (Illinois) High School study hours for several departments have been introduced.<sup>1</sup> Superintendent F. M. Giles of De Kalb describes the plan as follows:

We took five minutes from each of the six recitation periods, which we have in our school day, and put these together to make a thirty-minute study period coming once a day. In order that each class might receive the benefit of this period, we arranged that the first period class use the time on Tuesday; the second period class on Wednesday; and the third period class on Friday; the following week that the fourth, fifth, and sixth period classes use the period for supervised study. On Monday and Thursday the teacher uses this study period by having come to her room for individual attention, such students as she thinks may need individual help. So much for the plan.

In regard to the results, we have found that the plan is of greatest advantage with the younger students, and in the first part of a subject. That is, the younger students need direction in method of study, and all the students find it helpful when learning the method of attack upon a new subject.

We find it necessary, of course, to keep some definite check upon the work of the students. This is done by setting for them certain concrete problems in their study. For instance, to work out a certain number of examples; to be ready to prove a given theorem; to pick out the topic sentences in a given paragraph; to determine the most important points of a certain topic in physics; to pick out the leading events in a given historical topic, etc. We find the method works very well in mathematics, science, and history. Some difficulty has been experienced in the study of an English classic, such as *Macbeth*, in making the work of the study period definite. We are working at this problem.

Besides teaching methods of study, we have found one decided advantage of this study period is that by reason of it, the teacher gets a considerable

<sup>1</sup> See editorial in *School Review* for January, 1913, p. 58.

insight into the methods of study of the various students and can discover those who waste time, who have faulty methods of attack, etc.

Another point which we have found as a result of this work is that the teachers themselves are not at all clear as to definite methods of study. There have been a number of problems raised as to how a student should study.

The success of the plan is perhaps due to the following advantages:

1. Some progress is made in that the teacher has an opportunity to find out the real difficulties that the pupils experience in the various subjects.

2. Backward or dull pupils can receive assistance on points which are not clear, and can receive assistance at definite periods where otherwise they would tend to become discouraged.

The greatest disadvantage of the plan is the limited amount of time given to this study class. It gives the teacher little opportunity to supervise in any effective way the study of pupils. Pupils can come merely for assistance on difficult points. Little opportunity is offered for individual work with the pupils. The time which the teacher spends with the pupil is too short for the teacher to do much in aiding the pupils in acquiring proper methods of study.

In the Pittsburgh high schools, supervised study was arranged for by using one class period a week for each of the subjects, English, mathematics, Latin, and German. For this period no arrangement of lessons is made and no preparation is required, while no grade of any sort is given for the work of the hour. The time is used by each teacher as he or she may think best, either as (1) a review of the past work, (2) preparation for future work, (3) emphasis on particular portions of the work which require attention, (4) a "clearing-house" period for review, drill, handing back papers, discussion, or personal help to pupils who may be back in their work on account of excusable absences, or (5) "spell-downs," or other games to clinch the work covered in the class periods. After a year's trial, the experiment was considered a success because of the following advantages gained:

1. Increased efficiency in the quality of the work done, due to a better understanding of the work.

2. The students became enthusiastic over the conference hour and took a keener interest in the classroom work.

3. Pupils felt free to discuss the difficulties of the assigned work, since no marks of the hour were kept.



4. Every pupil was given an opportunity to have any part of the work covered in the regular class period discussed freely and any difficulties explained.

5. Teachers had an opportunity to develop right habits of thinking, proper methods of attacking new problems, and correct methods of study.

The following disadvantages of the plan are apparent:

1. The time allowed—one hour a week for each subject—is not sufficient to do the most effective work.

2. The time could more profitably be spent in really supervising the study of the pupils rather than, as now, in clearing up difficult points or emphasizing important points, which makes out of it little more than a regular recitation period.

3. Unless the teacher were a good disciplinarian and at the same time enthusiastic over her work, there would be a tendency to regard these periods as recreation periods when nothing was expected, and as a consequence little would be accomplished.

4. Only the brighter class of students who were efficient and who really required little help would be likely to bring up questions of difficulty. The careless or indifferent pupil who really needed to be taught how to study would have no points to discuss.

*The double- or divided-period plan is in use in many schools.—*

In the Joliet Township High School, this method of supervising study has been tried for about three years. In response to a letter of inquiry, Principal J. Stanley Brown describes the plan as follows:

The plan means that two periods of forty minutes each are set aside for first- and second-year classes. One of these periods is devoted to recitation work. The second period, which immediately follows the first with an intermission of a minute or two, is given up to supervised study. The teacher passes about the room, directs the work of the pupils, assists them when absolutely necessary, and thinks she accomplishes as much in that single period as the pupil alone unaided could accomplish in two periods. This supervised work has been applied especially to mathematics work, arithmetic, algebra, geometry, in the first and second years in the school. It has been applied with excellent results to beginning foreign language work, Latin, German, French. Of all the teachers who have had experience in this experiment, only one is unfavorable, so I think we can say the experiment is fairly successful. At any rate, we shall continue to use the plan mentioned until we find something

better. We have various other experiments going on all the time, most of which prove unsuccessful, but if after five new experiments, we secure one favorable result, we think the result was worth while.

At the University High School, Columbia, Missouri,<sup>1</sup> a plan is followed by which study under the teacher's supervision is made possible by reducing the time of the recitation to a minimum. Approximately one-third of the class hour is spent in recitation, leaving the remainder for study and careful assignment of lessons, thus reversing the common practice by which little time is given to study but most of it to the recitation. The class hour is divided into three parts: (1) Study: The object of this is not to make home study unnecessary, but to train the pupil so as to make more effective home study possible. He is taught the methods of study. (2) The assignment of the next day's lesson: The assignment is not necessarily new work. It supplements the home study done in class or continues and completes work begun there. (3) The recitation: The recitations are no longer poor and time consuming, because the preparation was well done. Thus the standard of the recitation is greatly raised.

*General testimony concerning success of supervised study.—*

The general testimony concerning the efficiency of supervised study in improving the work of pupils is strongly favorable. A good example is the testimony of Superintendent Charles C. Hughes, of Sacramento, California. A news item stating that in the Sacramento schools home study had been abolished and supervised study introduced suggested a letter of inquiry to Superintendent Hughes who replied in a letter as follows:

I feel quite sure of my stand in this matter, since as early as 1899 when city superintendent of schools of Alameda, California, I abolished home study, and substituted for it actual periods for each subject demanding study in the school-program, thus providing, under special supervision of the teacher, intensive study during school hours. The Alameda schools still retain the plan, and several of my principals who have become superintendents since are firm advocates of the plan, and have instituted it in their departments. I found that children were not learning how to study. The University and the high schools complained that students came to them ignorant in this matter. I found that the average home made no preparation for children's study. If the standard was low the light was inadequate, and the surroundings often

<sup>1</sup> J. L. Meriam, "Reaction and Study," *School Review*, November, 1910.



pernicious. As the home standards were raised, the social life of the family interfered, and the case was rare where a study room, or even a study place properly lighted, heated, or ventilated, was prepared for the child or children in the family. The parents were found either unable or unwilling to aid their children in study. We discovered that we were shifting to the home the duty which belonged to the school.

After the plan was put into operation we soon discovered that, although we had cut down the number of recitations considerably, the periods of intensive study under supervision made up many times for the reduction.

We also found that we could make a better measure of the children—that teachers were, under the old system, apt to pat the quick boy on the back and praise him, when he had studied probably not more than a few minutes at home, and scold his slower brother who had really put in considerable time, thus making a prig or bluffer of the one, and eventually discouraging the other. The school should not be a recitative machine. Study is more important than the recitation. We are getting better results in our work and the teachers know their pupils better. The school is taking upon its shoulders its whole duty, instead of only part of it.

Our plans for supervised study in the elementary schools are embodied in the inclosed schedules, which I am glad to send. We have extended the idea, only in part, to the high school. I have no printed data showing the efficiency of supervised study.

Under the first question I have given you the result which any teacher will testify to. The high schools are feeling it where it is in operation, since the boys and girls come to them better prepared as independent students. We have departmental work in our grammar grades and the success of departmental work depends very largely upon the abolition of home study. Young children would be handicapped and the departmental work ruined if each teacher were allowed to give as much home work as she believed her subject called for. Under our system, her judgment is immediately impeached when she gives more than the study period set aside for that purpose.

One of the defects of our modern high school with its fine specialization lies in the fact that each teacher gives as much as any child can do in an evening, which results in a child having three or four times as much as he can do, with the further result that he becomes discouraged, or attempts to bluff his way through.

#### *Experimental proofs of superiority of supervised study.—*

Before final conclusions are drawn regarding the efficiency of supervised study, the general testimony should be supported by exact measurements. The following three examples show the superiority secured by supervised study in mathematics and history.

To measure the effect of home study upon class progress, the following experiment was tried in the Department of Mathematics of the University High School, University of Chicago,<sup>1</sup> with two algebra classes. No home work was assigned in one section, so that the time usually taken up with the discussion of home work was gained for study. In another class, taking the same work, home work was assigned. The method of instruction in both sections was the same. Both sections spent fourteen lessons on the chapter on simultaneous linear equations, at the end of which the same test was given to both with the following results:

	A	B	C	D	F	Average
Section A (Home work with no supervised study).....	7.1	21.4	21.4	0	50	62.8
Section B (Supervised study with no home work).....	0	6.2	37.5	25	31.2	65.5

The low grades received in both classes may be explained by the fact that the test was not easy, and that no review was given in preparation for the test. If the time had allowed it, a second and fairer test would have been given.

Some idea as to the relative ability of these classes can be obtained from the results of the departmental final examination given at the end of the preceding semester. The grades were distributed as follows:

	A	B	C	D	F	Average
Section A.....	25	25	37.5	12.5	0	81.4
Section B.....	29.4	23.5	23.5	17.7	5.9	79.4

It is seen that section B, though a little weaker than section A, came out a little stronger on the average after supervised study without home work. The poorer students profited particularly by this method. Supervision seems to have enabled pupils at least to make up for the loss of time due to lack of assigned home work. The average amount

<sup>1</sup> "Teaching High-School Pupils How to Study," *School Review*, XX, 505-15.

of time spent on home work in section A was one hour and fifteen minutes per lesson. However, when the number of problems worked in each section was counted, it was found that in section A the average number of problems per pupil was two less than in section B. These results indicate that the amount of home work may be reduced in high-school classes, provided a method of instruction more effective than the common method is used.

It was interesting to notice the progress of the class working under supervision. At first the class was very slow, and it did not get along as rapidly as the other section. During the third lesson, however, it became evident that the pupils were learning to work independently. After the fourth lesson both classes were doing the same work, and they were kept together for the remainder of the time the chapter selected was being studied.

The section under supervision worked with more confidence and pleasure. This was especially true of the slow pupils. A girl who had failed during the first semester and was in the class on condition made a grade of 78 in the test on this chapter. Her grade in the final examination at the end of the first semester had been only 40. A boy who barely received a passing grade at the end of the first semester, and who at first seemed to be unable to do anything under supervision, suddenly found that with a little greater effort he could do as well as his classmates. There was an immediate improvement, and one day when a speed test was given he surprised everybody, even himself, by leading the class. A girl returning after a week's illness, and still in a weakened condition, said she "could not understand anything that was said," and felt greatly discouraged. By giving her a little more attention than the other pupils she was enabled to do the work before the end of the recitation, and had no further difficulty. Under the common system of instruction very little attention is paid to such cases. The teacher usually allows a certain amount of time in which the pupil must "catch up." Very often, in addition to the difficulties found in understanding the class work, "back work" is assigned. The injustice of all this at times drives some pupils to use dishonest means of getting possession of all this required work.

The following chapter, on "operations with fractions," was covered by both classes in six lessons. However, section A now worked under supervision, and section B took home work. A test was given to both

classes as soon as the chapter was completed. The grades in this test were as follows:

	A	B	C	D	F	Average
Section A.....	31.2	25	18.7	12.5	12.5	77.5
Section B.....	52.9	23.5	5.9	11.8	5.7	86.4

The average amount of time per lesson spent on home work was thirty-six minutes. The number of problems could not be computed because much oral work was done in section A, but there was very little difference. The power obtained by section B in the preceding chapter, while working under supervision, persisted and was strong enough to be helpful in the following chapter.

Before any final conclusions can be drawn, evidently further experimental work is needed. The results of the foregoing tests, however, corroborate the impression received during the time the study of these classes was being made. Both classes accomplished the same work within the regulation time, although section B did no home work and section A spent an hour and fifteen minutes daily on the assigned lesson. Section B, the weaker section at the end of the first semester, came out stronger than section A, after nearly three weeks of supervised study, and proved to be still stronger during the study of the next chapter. In both classes progress under the new method was very slow at first, but there was rapid improvement.

Following these experiments in the Department of Mathematics in the University High School, some of the instructors there practically omitted home work because their experience showed that better results could be obtained by giving the time of the class period to class work on the part of the pupil rather than to reciting the lesson. In the final departmental examination of the first year classes the section in which home work was minimized ranked second, while in the second- and third-year courses, the classes doing little home work ranked first. Thus with supervised study loss of home work did not retard the progress of these classes.

*The same superiority of supervised study was shown in an experiment in classes in mathematics in Bloomington, Indiana.<sup>1</sup>—*

Thirty-six pupils were divided into two groups of eighteen each and of abilities as nearly equal as possible. Their abilities had been

<sup>1</sup>J. H. Minnick, "An Experiment in the Supervised Study of Mathematics," *School Review*, December, 1913, p. 670.



determined by the average grades of three semesters' work in algebra. The group which was to have supervised study was not quite as strong as the unsupervised group. The unsupervised class recited the first period and prepared the assigned home work wherever they saw fit. The supervised class recited the second period and prepared the home work under supervision during the third period, with the understanding that no further work was expected of them. Every pupil was kept busy during this study period either by working on the assigned home work or by additional work. The experiment was carried on for fifteen weeks, and the weekly average marks received for recitation were compared. It was found that the supervised class had the higher average. The results of the examination are given in Table IV.

TABLE IV

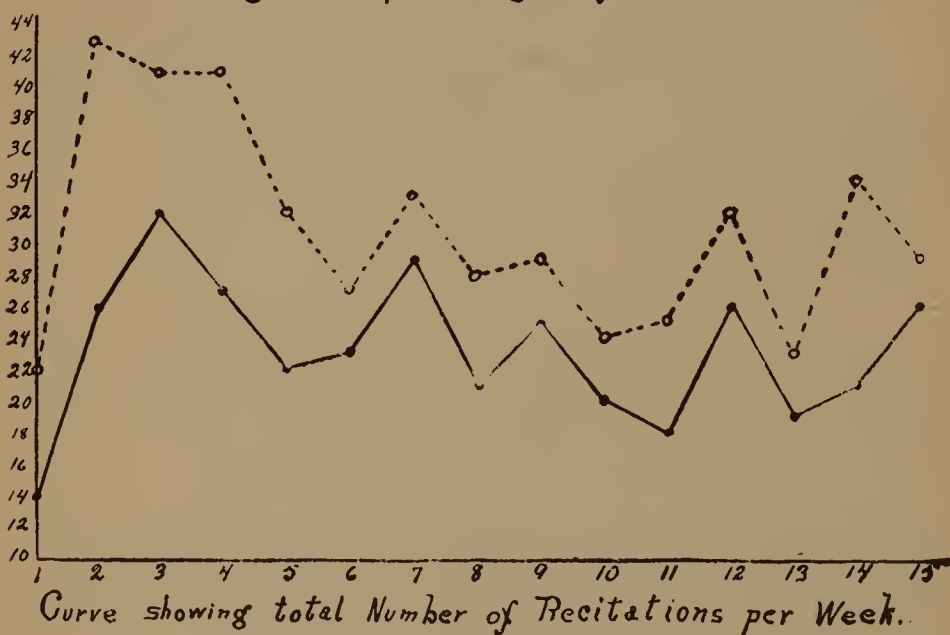
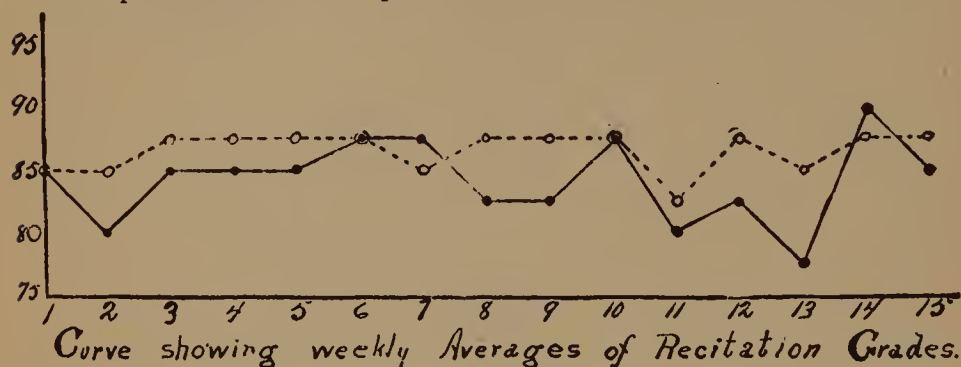
KIND OF EXAMINATION	NO. OF EXAM.	AVERAGE OF CLASS		AVERAGE NUMBER SOLVED	
		Supervised	Unsupervised	Supervised	Unsupervised
Six-weeks examinations .	{ 1	77.3	68.7	4.2	3.55
	2	81.2	80.4	4.3	3.9
Final examination.....	1	92.4	80.1	12.7	12.2
Tests consisting of new materials.....	{ 1	82.4	73.9	4.8	4.4
	2	87.3	70.2	4.8	3.7
	3	77.6	56.2	2.1	2.1
	4	82.8	77.3	4.2	3.8

Thus in each of the six-weeks examinations and the final examination the supervised class excelled in both the average grade and the average number of problems solved. As these examinations covered only the work discussed in recitation, the results indicate that this class had mastered the text better than the unsupervised class. In each of the remaining four tests the average grade of the supervised class was decidedly better than that of the unsupervised class and in only one case did the average number of problems solved by the unsupervised class equal that of the supervised class. As stated above, these tests consisted of problems which were new to both classes and the results therefore indicate that the supervised class was the more able to attack new problems, thus contradicting the arguments of those who believe that supervised study makes the student dependent upon the instructor.

A record of both the amount and the quality of the recitation work was kept. The amount of work was indicated by the number of times students made definite recitations, such as demonstrations and constructions. The quality of the work was indicated by a recitation grade given at the time the recitation was made. A comparison of these records for the two classes is shown in the graphs below. In each curve the horizontal units represent weeks.



The vertical units of the first curve represent weekly averages, while those of the second curve represent the total number of recitations per week. The continuous curves represent the work of the unsupervised class and the dotted curves represent that of the supervised class. An examination of these curves



○ — Supervised Class.

● — Unsupervised Class.

shows that the supervised class had the higher average for ten of the fifteen weeks. The unsupervised class ranked higher for two weeks and the averages were the same for the other three weeks. The second set of curves shows that the supervised class made the larger number of recitations every week throughout the semester.

There were no failures in the supervised class at the end of the semester, while in the unsupervised class two pupils failed. The pupils' attitude was in favor of the supervised plan.

*There is need for similar studies in other subjects.—*

Mr. Garrett E. Rickard, principal of the Oakland City High School, Oakland City, Indiana, has prepared the following scheme for testing methods of instruction in history.

In investigating the relative merits of class recitation and supervised study in high-school history teaching, the preliminary problem divides itself logically into three parts: (a) the setting up of definite aims or ends to be reached by history teaching; (b) the devising in detail of two distinct methods of instruction, one based on class recitation, the other on supervised study; (c) the construction of laboratory conditions which shall leave but one variable element, namely, the method of instruction.

#### A. Aims

##### 1. *To develop the pupil's ability to answer questions based on:*

- (1) Acquisition of the proper concept of new and technical terms.
- (2) Mastery of the subject-matter of the text.
- (3) Interpretation of source material.
- (4) Abstracting collateral reading and connecting it with the outline of the text.

##### 2. *To develop the pupil's ability to act by:*

- (1) Arranging logical outlines and abstracts of the subject-matter of the text.
- (2) Arranging tabulations of time sequences of events and persons, grouped according to some convenient unit, as decades or centuries.
- (3) Drawing maps which shall more or less closely approximate some ideal which the instructor has previously analyzed into its elements.
- (4) Collecting material on a given topic, organizing it logically, citing references and preparing bibliographies.

#### B. Methods of instruction

##### 1. *Class recitation which involves:*

###### (1) On the part of the instructor:

- a) A definite assignment (usually taking the form of questions) involving one or more of the above aims. (Time 5 minutes at the beginning of the period; the following involves the remaining 35 minutes.)

- b) A ten-minute examination at the beginning of each recitation on questions chosen at random from the previous day's recitation.
  - c) Elucidation of obscure points of previous day's assignment.
  - d) General instruction as to method of procedure. (See A, 2.)
  - e) Criticisms of pupils' performances, maps, tabulations, etc. (See A, 2.)
- (2) On the part of the pupils:
- a) Making a memorandum of the assignment. (Time 5 minutes at the beginning of the period. Remaining 35 minutes to be spent as follows:)
  - b) Answering questions on previous day's assignment.
  - c) Asking questions on previous day's assignment to clear up obscure points.
  - d) Submitting maps, manuscripts, etc., and criticizing those of other pupils.
2. *Supervised study which involves:*
- (1) On the part of the instructor:
- a) A ten-minute examination at the beginning of each day's recitation on questions chosen at random from the previous day's supervised study.
  - b) Assisting the individual pupil by the aid of reference books or questions to get proper concepts of the new and technical terms of the assignment just made.
  - c) Assisting the pupil definitely to arrange the outlines, tabulations, or maps of the assignment just made by pointing out to him the elements in his task to be striven for, and criticizing constructively his work.
  - d) Giving to each pupil an approximately equal amount of time.
- (2) On the part of the pupil:
- a) Making a memorandum of the assignment. (Time, 5 minutes. The following to occupy the remaining 35 minutes.)
  - b) Study with the teacher as per above.
  - c) Independent work with pen, books, and paper on the assignment just made, when he is not being assisted by the teacher.

### C. Laboratory conditions

1. Have the whole class study and recite as usual for a given period. (Three weeks will be convenient.)
2. Have the pupils write on a topic discussed on the previous day for ten minutes at the beginning of each period.

3. Grade the papers with one of the following marks: 100-90, 89-80, 79-70, 69-60, 59-50, below 49, or in letters, A, B, C, D, E, F.
4. Average each pupil's grade for the period.
5. Rank pupils on the basis of their grades, putting the highest first, the lowest last.
6. Let the odd numbers constitute section A; the even numbers section B.
7. Allot to each section forty minutes of your time.
8. Proceed with section A by the class recitation method (B-1), with section B by the supervised study method (B-2).
9. Give each section the same assignment on the same day.
10. Instructor and pupils should keep an accurate dated record of the assignments.
11. All maps, tabulations, outlines, and reports should be graded as in C-3 above, and filed.
12. Bring both sections together for the same written examination at the close of each month.
13. These papers should be graded as in C-3, and filed.

In accordance with this scheme Mr. Rickard has been testing for the last two months the effect of supervised study. He introduced supervised study into a class in history whose average grades for one month had been found to be slightly lower than the averages of another group of pupils taking the same work. After this class had been subjected to supervised study, its daily average grades became higher than the average grades of the other class.

Thus it seems that all of these three experiments are favorable to supervised study. With supervised study in the high school, the amount of home work to be expected of pupils could probably be lessened, or omitted entirely if the class periods or the school day were lengthened. Even as little as five minutes added to each recitation would mean much to the supervised study classes while the addition of that much time would hardly be felt as a burden by pupils or teachers. There could always remain a certain amount of good home work for the brighter pupils, but the slow pupil would do almost all of his work at school during school hours under guidance of his teachers.

*Sometimes objection to supervised study is made on the ground that it would cause additional expense.—*

Mr. Minnick argues in his paper that supervised study would not increase the expense of instruction as much as it is supposed, because the

instructor can handle more pupils in a supervised class, because consultation periods could be abandoned and because the decreasing number of failures lessens the number of pupils repeating courses.

*A special technique is to be developed for supervised study classes.—*

Unless a system is such that the ordinary teacher can use it successfully without too much additional work, it will be of value to a small part of the teaching public. It is comparatively easy to organize supervised study in classes of mathematics, but rather difficult in other subjects. Assuming that the teacher himself has a knowledge of the principles of learning, the two general characteristics of conducting a supervised study period should be to find out what the pupil is thinking in struggling with the assigned lesson and to guide him properly without giving him too much assistance. The various suggestions given by teachers who have introduced supervised study in their classes are summarized in the following:

1. Teachers should take a new attitude toward home work. They should break themselves of the habit of prescribing the regulation amount of home work daily. Pupils cannot be expected to prepare lessons well unless they know definitely what is expected of them. Rather than to assign a lesson of doubtful difficulty and to receive lessons poorly and dishonestly prepared they may omit the home assignment altogether. Home work should have the character of completing the class work of the previous day, not of preparing for the next. This will enable even the slow pupil to apply his time to it with success and profit. Let the pupil struggle with really new work under the supervision of the teacher, but let home work be preceded by enough similar work in the classroom to furnish a pupil a clew to prevent his working in the dark. With this new rôle assigned to home work a change in class methods should follow.

2. The time ordinarily used for recitation should be shortened or omitted altogether. The time gained can then be used for supervised study and for the development of new work. This is the teacher's opportunity to teach pupils how to study. As he watches the pupils at work, instead of ignoring a pupil who is slow and apparently backward, unable to do what some more gifted pupil can easily do, he finds out the difficulty that prevents a normal rate of progress. Perhaps he must go back to the foundation, where the pupil has real knowledge, to make progress with new material possible. False assumptions, false errors



false methods are corrected as quickly as they appear. By analyzing the habits of study of a pupil his weakness may be discovered and conscious steps be taken to form or strengthen certain habits that need attention. This work should receive most careful attention. Pupils when left to themselves do not appreciate the value of time. In the classroom they can be taught to start a piece of work promptly and to keep at it at a rate of accomplishment not too slow, but not too high to interfere with accuracy and neatness. An economical use of time is the true mode of securing leisure. Ability to select, arrange, or pick out facts according to their value or "method" is a most important factor. Method enables a larger amount of work to be done with satisfaction. The cultivation of undivided attention must be going on always with special emphasis upon effort to retain. One of the most essential habits of study to be developed constantly is the ability to read carefully with understanding, not mechanically. This ability is commonly presupposed. Yet it is often lacking. Let the teacher ask the pupils to retell what they have read. This will make them read with attention and concentration, learn how to skip judiciously, and will fix what they have read in the memory as in no other way.

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# NORTH CENTRAL HIGH SCHOOLS

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## INTRODUCTION

In view of the remarkable development of the public high school within recent years and the increased demands made upon it, facts pertaining to the organization and administration of high schools are significant. The schools in the North Central states have been subjected to more or less inspection for the past forty years, during which time the accrediting system providing for admission to college by certificate has become almost universal. Through this system the schools of each state have been subjected to more or less definite standardizing pressures. Differences in standards, however, from state to state and indeed within the same state have always been noticeable. In 1895 the North Central Association of Colleges and Secondary Schools was organized with the idea of setting up standards which might be attained by a selected group of schools in a number of states. This association has met with cordial support from the colleges and secondary schools. Today there are nearly 800 schools distributed through the North Central states on the approved list, i.e., the principals of these schools have convinced the Board of Inspectors that the work is up to the standard named by the association.

The annual reports submitted by 667 of these schools for the year 1911-12 have been analyzed with the view of setting forth a body of facts relating to the group of schools on the list for 1912. These schools are distributed in the different states as shown in Table I.

It is to be noted in the foregoing that the number of schools in the different states varies from 15 in North Dakota to 104 in Illinois. For the most part the number of high schools in the various states on the North Central list fairly represents the total distribution of high schools

TABLE I

State	No. of Schools	State	No. of Schools
Colorado.....	30	Missouri.....	37
Illinois.....	104	Nebraska.....	35
Indiana.....	50	North Dakota.....	15
Iowa.....	57	Ohio.....	97
Michigan.....	77	Wisconsin.....	87
Minnesota.....	58		

of the various types within each state. There are hundreds of small high schools throughout this territory that are accredited only within a single state by the state's own accrediting agency. Some of the differences are, no doubt, due to the fact that some states are more adequately equipped for inspecting these schools than are others, i.e., there are probably many schools not on the North Central list simply because of a lack of enough inspectors to visit them.

#### SIZE OF SCHOOLS

The actual enrolment of the high school is of importance in connection with the enforcement of standards. It is possible for the enrolment to be so small that the number found in the Senior class who will go to college is insufficient to justify either the high school or college in attempting to coördinate their work. Small enrolment means that classes must be small, which condition quickly places a limit on the number of elective courses or units which can be provided in the high school. On the other hand the small high school may mean a more narrowly selected group of students with a narrower range of interests and abilities.

There is rather wide variation within each state in regard to the enrolment of the approved schools; yet the median enrolment shows definite differences in this particular in the various states. This is shown in Table II.

TABLE II

State	Median Enrolment	State	Median Enrolment
Colorado.....	206	Missouri.....	204
Illinois.....	143	Nebraska.....	137
Indiana.....	244	North Dakota.....	112
Iowa.....	184	Ohio.....	215
Michigan.....	200	Wisconsin.....	184
Minnesota.....	140		

An interpretation of this table shows that one-half of the schools on this list in Colorado have an enrollment of 206 or fewer; in Illinois of 143 or fewer; in Indiana of 244 or fewer, etc. The high schools of Indiana, Ohio, Michigan, Colorado, and Missouri on the accredited list are decidedly larger than those in the other states.

Variations in the enrolment of high schools in the different states means variation in regard to the difficulty of conforming to the standards set up by the association. The large high school might have no difficulty in maintaining courses and conditions meeting the requirements for students going to college and at the same time be able to maintain many other courses for students with other interests. In other words, in case the school on this list is so small that a single course is offered, this course must conform to the North Central standard; hence the possibility of the coercive influence of such standards.

*Size of cities<sup>1</sup> supporting these high schools.*—The variation in the size of cities maintaining schools listed for approval by this association is of interest. The high schools of practically all the large cities are on the list; however, one-third of the whole number of approved schools are in towns of 5,000 or less; two-thirds in cities of 10,000 or less. Thus it is seen that the association has been an influential force in the small cities and towns.

TABLE III

State	Median Population	State	Median Population
Colorado.....	7,500	Missouri.....	7,500
Illinois.....	9,250	Nebraska.....	4,700
Iowa.....	4,700	North Dakota.....	3,430
Indiana.....	9,000	Ohio.....	8,200
Michigan.....	8,750	Wisconsin.....	4,700
Minnesota.....	5,830		

Table III shows the median size of cities in the various states supporting approved high schools. Rather striking contrasts appear in comparing Illinois with North Dakota or Iowa. The median size of cities in Iowa, Nebraska, and Wisconsin is practically the same. Illinois, Indiana, Michigan, and Ohio seem to belong to another group. Again, it is significant that such a large number of small towns and cities are willing to conform to the prescribed standards.

<sup>1</sup> Throughout the rest of this paper the word "cities" will be used to refer to both towns and cities.



*Enrolment and population.*—The variation in the size of cities and in the size of high schools is shown in Table IV. The cities are classified as A, B, C, etc., on the basis of population, Class A cities having a population of 2,500 or less; Class B cities having a population of 2,501 to 5,000, and so on.

TABLE IV  
COMBINED SUMMARY

Total Enrolment	A	B	C	D	E	F	G	Total
	Under 2,500	2,501 to 5,000	5,001 to 7,500	7,501 to 10,000	10,001 to 15,000	15,001 to 50,000	50,001 and above	
Under 50.....	4	4	1	.....	1	.....	.....	10
51 to 75....	11	8	2	.....	.....	1	3	26
76 to 100....	14	20	8	1	2	.....	3	50
101 to 125...	25	34	16	1	5	2	3	86
126 to 150...	12	33	20	4	4	5	.....	78
151 to 175...	4	25	17	5	1	.....	.....	52
176 to 200...	1	19	11	2	8	.....	.....	41
201 to 225...	.....	4	1	7	3	4	.....	19
226 to 250...	2	10	18	19	9	1	.....	59
251 to 275...	.....	.....	5	4	3	5	2	19
276 to 300...	.....	5	7	10	10	11	1	44
301 to 350...	1	.....	4	6	10	11	2	34
351 to 400...	.....	.....	1	5	5	8	3	22
401 to 450...	.....	.....	.....	3	4	10	.....	17
451 to 500...	.....	.....	.....	.....	.....	10	4	14
501 to 550...	.....	.....	.....	.....	1	8	2	11
551 to 600...	.....	.....	.....	.....	.....	8	1	9
601 to 650...	.....	.....	.....	.....	.....	3	3	6
651 to 700...	.....	.....	.....	.....	1	5	1	7
701 to 750...	.....	.....	.....	.....	.....	3	4	7
751 to 800...	.....	.....	.....	.....	.....	1	2	3
801 to 850...	.....	.....	.....	1	.....	1	3	5
851 to 900...	.....	.....	.....	.....	.....	1	2	3
901 to 950...	.....	.....	.....	.....	.....	1	3	4
951 to 1,000...	.....	.....	.....	.....	.....	.....	2	2
1,001 to 1,050...	.....	.....	.....	.....	.....	1	3	4
1,051 to 1,100...	.....	.....	.....	.....	.....	.....	1	1
1,101 to 1,150...	.....	.....	.....	1	.....	.....	2	3
1,151 to 1,200...	.....	.....	.....	.....	.....	.....	2	2
1,201 to 1,250...	.....	.....	.....	.....	.....	.....	5	5
1,251 to 1,300...	.....	.....	.....	.....	.....	.....	2	2
1,301 to 1,350...	.....	.....	.....	.....	.....	.....	1	1
1,351 to 1,400...	.....	.....	.....	.....	.....	.....	1	1
1,401 to 1,450...	.....	.....	.....	.....	.....	.....	.....	.....
1,451 to 1,500...	.....	.....	.....	.....	.....	.....	3	3
1,501 to 1,600...	.....	.....	.....	.....	.....	1	3	4
1,601 to 1,700...	.....	.....	.....	.....	.....	.....	1	1
1,701 to 1,800...	.....	.....	.....	.....	.....	.....	3	3
1,801 to 1,900...	.....	.....	.....	.....	.....	.....	1	1
1,901.....	.....	.....	.....	.....	.....	.....	.....	.....
	74	162	111	69	67	101	73	667

This table should be read thus: Of the high schools enrolling fewer than 51 pupils four were in cities with a population of 2,500 or under; four in cities of 2,501 to 5,000 population; one in a city of 5,001 to 7,500 population, etc. An analysis of this table, by reading from left to right, brings out the striking variation in the size of the city in which is found a given-sized high school. For example, high schools with an enrolment of 101 to 125 are found in towns and cities of practically all sizes. Reading from the top to the bottom, one can see the wide variation in the size of high schools in cities of the same class. For example, cities of 2,500 and under are supporting accredited high schools varying in size from 50 or less to 301-350; cities of 7,501 to 10,000 have high schools as small as 100 and as large as 850. It is seen that one-eighth of all of these schools enrol 100 or fewer students; one-half, 200 or fewer; three-fourths, fewer than 351. The middle 50 per cent of the schools enrol from 125 to 350 pupils. Ought not these central tendencies and these variations be considered in determining standards for accrediting?

The material presented in Table IV is of value in comparing cities in relation to high-school enrolment and population. In case of a desire to compare the high-school enrolment of a particular city with the enrolment in other cities of the same class, the following plan might be carried out. Let us say that the city has a population of 4,500 and an enrolment of 100. Now referring to Table IV above, we find that the city is in class B. By running down the column headed "Total Enrolment" to 76-100, then to the right, to column B, it is found that 20 cities in this class have an enrolment of 76 to 100; thus other cities of this class have the same sized high schools. However, when it is noted that there are data for 162 high schools in cities of this class, it becomes important to find its relation to the whole group of schools. The answer is 130, or 80 per cent of the cities show a larger enrolment while only 7 per cent show a smaller enrolment. As a means of ready reference the following table of medians might be used. This table shows the median enrolment for each class of cities.

Class	A	B	C	D	E	F	G
Median enrolment. . . . .	109	162	175	243	250	450	841
No. cases. . . . .	74	162	111	69	67	101	73

*Number of teachers and enrolment.*—One index of the adequacy of the provision made for a high school in any community is the number of

TABLE V  
CORRELATION OF TEACHERS AND ENROLMENTS

Total No. of Teachers	50	51 to 100	101 to 150	151 to 200	201 to 250	251 to 300	301 to 350	351 to 400	401 to 450	451 to 500	501 to 550	551 to 600	601 to 650	651 to 700	701 to 750	751 to 800	801 to 900	901 to 1,000 and Over	Total
4.....	15	32	30	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	78
5-6.....	12	56	55	28	7	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	159
7-8.....	2	16	34	32	33	7	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	124
9-10.....	4	4	8	12	22	11	6	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	69
12.....	.....	2	1	8	10	16	10	2	2	1	.....	.....	.....	.....	.....	.....	.....	.....	52
14.....	1	.....	1	.....	4	7	8	5	4	.....	.....	.....	.....	.....	.....	.....	.....	.....	30
16.....	.....	2	1	.....	3	3	5	4	5	1	.....	1	.....	.....	.....	.....	.....	.....	25
18.....	.....	1	.....	.....	.....	4	4	4	3	4	1	.....	.....	.....	.....	.....	.....	.....	22
20.....	.....	.....	.....	.....	.....	.....	1	2	2	2	2	3	.....	2	2	.....	.....	.....	12
22.....	.....	.....	1	.....	.....	.....	.....	2	1	2	.....	1	.....	.....	.....	.....	.....	.....	13
24.....	.....	.....	.....	.....	.....	.....	.....	1	.....	3	2	1	.....	.....	.....	.....	.....	.....	8
26.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	9
28.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	4
30.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	4
32.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	6
34.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4
36.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3
38.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3
40.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	6
42.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4
44.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2
46.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3
48.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3
50.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3
52.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5
58.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1
60.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2
62.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1
64.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1
66.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3
68.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1
75.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1
78.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1
100.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0
Median teachers	34	113	131	81	79	48	35	20	18	16	6	9	6	6	8	8	8	32	660
	4	5	5	7	8	11	12	16	15	20	20	24	25	25	28	36	32	50	

teachers employed. Inasmuch as the North Central Association refuses to approve a school with fewer than four teachers, this is the smallest number of teachers reported. However, wide variation exists in practice in regard to the number of teachers in these schools. The range is from 4 to 100 and above, in schools enrolling fewer than 50 to 1,000 and over. "Four-teacher" schools vary in enrolment from 50 or less up to 151-200; "six-teacher" schools vary from 50 or less to 301-350. The complete distribution is given in Table V.

From the foregoing table it is seen that wide variation exists in regard to the number of teachers employed and the actual size of the high school. For example, of the 34 high schools enrolling 50 or fewer students the number of teachers varies from 4 to 13 or 14. Again, reading from left to right, 9- to 10-teacher schools are found enrolling as few as 50 pupils, and as many as 300 to 350 pupils. Certainly the opportunity for work in the schools represented by these extremes is not the same. Standards that could be met readily in the school with 10 teachers and 50 pupils might be impossible in the schools with the same number of teachers and 350 pupils.

*Differences from state to state.*—Certain differences in the size of school represented by the number of teachers appears in an analysis of the material in the different states. Table VI shows the median number of teachers in the different states.

TABLE VI

State	Median No. of Teachers	State	Median No. of Teachers
Colorado.....	9	Missouri.....	6
Illinois.....	9	Nebraska.....	5
Indiana.....	10	North Dakota.....	7
Iowa.....	7	Ohio.....	8
Michigan.....	8	Wisconsin.....	6
Minnesota.....	8		

It is seen that the schools in Indiana are relatively large while the schools in Nebraska are relatively small.

In order to bring out more clearly the differences in the various states, Table VII has been prepared.

The meaning of this table becomes clear when read as follows: In Colorado the six-teacher schools have a median enrolment of 150; the

eight-teacher schools have a median enrolment of 208. In Illinois the six-teacher schools have a median enrolment of 100 and the eight-teacher schools, an enrolment of 133, etc. These figures indicate that the different states are meeting the problem of the distribution of the number of pupils per teacher on somewhat different lines.

TABLE VII

State	Median Enrolment	6	8
		No. of Teachers	
Colorado.....	" "	150	208
Illinois.....	" "	100	133
Indiana.....	" "	140	250
Iowa.....	" "	100	125
Michigan.....	" "	106	120
Minnesota.....	" "	75	110
Missouri.....	" "	110	175
Nebraska.....	" "	87	137
North Dakota.....	" "	75	125
Ohio.....	" "	175	225
Wisconsin.....	" "	150	196

In view of these differences in enrolment for the same sized teaching force it would seem that the outside standardizing agencies would affect these schools with widely varying pressures. Is it not probable that many criticisms of the pressures brought to bear by accrediting agencies are due to just this variation? Surely some schools find it much more of an effort to conform to the North Central Association standards than others. It would be of interest to know more about the comparative results attained in the schools of Ohio and Indiana with relatively large numbers of pupils per "six-" and "eight-teacher" school, as compared with Iowa and Michigan with relatively small numbers of pupils.

*Standard ratio of teacher to enrolment.*—Table VIII, showing the median number of teachers per enrolment unit, should enable school authorities to determine quickly the status of a particular school in this connection.

*Average number of students per teacher.*—Another way to consider the provision which different communities make for their schools is by dividing the total number of students by the total number of teachers in the high school (taken irrespective of the number of recitations taught by



TABLE VIII

	Enrol- ments of 50 or less	51 100	101 150	151 200	201 250	251 300	301 350	351 400	401 450
Median number teachers.....	4	5	5	7	8	11	12	16	15

	Enrol- ments 451 500	501 550	551 600	601 650	651 700	701 750	751 800	801 850	851 1,000 and Over
Median number teachers.....	20	20	24	25	25	28	36	32	50

the teacher). The average number of pupils per teacher calculated on this basis varies from as low as 5 pupils per teacher to as high as 50 pupils per teacher. Table IX shows this variation.

TABLE IX

Total No. Students per Teacher	Under 2,500	2,501 to 5,000	5,001 to 7,500	7,501 to 10,000	10,001 to 15,000	15,001 to 50,000	50,001 and Over
5.....	1	5	2	.....	1	.....	.....
10.....	15	14	5	1	2	2	7
15.....	15	23	21	10	8	11	3
20.....	24	51	37	20	23	34	9
25.....	16	44	30	20	23	30	28
30.....	2	20	9	12	8	16	12
35.....	.....	3	5	5	1	3	1
50.....	1	.....	.....	.....	.....	2	1
No. cases.....	74	160	109	68	66	98	61
Median.....	20	20	20	20	20	20	25

This table becomes clear when read thus: Of the 74 cities of 2,500 in population and under, one city employs a high-school teacher for every 5 pupils; 15 employ one teacher for every 10 pupils; 24 employ one teacher for every 20 pupils; 16 employ one teacher for every 25 pupils; two cities employ one teacher for every 30 pupils, and one city employs one teacher for every 50 pupils.

It is noteworthy that no clear correlation exists between the average number of students per teacher and the size of city; small cities adhere quite as closely to the central tendency in this particular as do the larger

cities until the population reaches 50,000; e.g., the employment of one teacher for every ten pupils is found in cities of every class. The median number of pupils per teacher, however, for each class is identical in all cities below 50,000 population.

This table is of interest in that it shows a fairly well standardized tendency in this particular. However, within the variations set forth it would seem probable that such striking differences in practice would be accompanied with equally striking differences in school achievement. The opportunity for individual contact between teacher and pupil is certainly far different in a city with an average of 5 or 10 pupils per teacher than in a city with an average of 30 to 50 pupils per teacher. Such differences surely call for different schemes of organization and administration if similar results are to be attained. In the face of such differences there can be but little doubt that the pressures of outside standardizing agencies fall with unequal intensity on the different schools. It would be of great administrative value to have a quantitative measure of the differences in achievements actually attained in these schools. If the results are the same when the ratio is 1 to 30 as it is where the ratio is from 1 to 10 in towns of the same class, we should know it.

ORGANIZATION

*Number of daily recitations.*—The number of daily recitations which a school provides is one measure of the flexibility or adaptability of the curriculum to the needs of the children. The four-year high school with a single curriculum and no electives with each class reciting daily will ordinarily offer 16 recitations per day. If the students are to be given

TABLE X

State	Range of No. of Recitations	Median No. of Recitations per Day
Colorado.....	15-100	40
Illinois.....	15-195	38
Indiana.....	15-155	50
Iowa.....	15-175	39
Michigan.....	20-150	38
Minnesota.....	15-230	38
Missouri.....	15-130	35
Nebraska.....	15-345	25
North Dakota....	15- 75	25
Ohio.....	15-235	38
Wisconsin.....	15-105	35

a choice, additional recitations must be provided. A wide range of electives in the small high school is unusual, partly because of the fact that a small enrolment means a narrower range of individual differences and partly because of the distaste on the part of the pupils and the teachers for the very small classes which necessarily follow, e.g., a Senior group of ten pupils does not permit of very many elective divisions. The exact distribution of the range in the number of recitations per day in the different states is given in Table X. This table should be read thus: In Colorado the number of recitations offered in the high schools on this list ranges from 15 to 100, with a median of 40; in Illinois the range is from 15 to 195, with a median of 38 and so on. The median number in Indiana is twice as large as Nebraska or North Dakota.

The minimum of 15 recitations found in practically all states indicates the effect of the college-entrance requirement of 15 units. A study of these figures suggests again that some of the schools are barely able to meet the North Central standard, while others, so far as the number of recitations is concerned, might offer a wide range of courses to suit many different tastes and abilities.

*Relation between number of recitations and size of city.*—It is important to know the distribution of the number of recitations offered in relation to the population within the territory. Table XI shows this relationship and the variation in number of recitations offered in cities of the same size; for example, of the 71 cities of 2,500 population or under maintaining high schools on this list, two have 15 recitations; thirteen, 16 to 20 recitations; seventy-six, 21 to 25 recitations; while one maintains 46 to 50 recitations. Similar variations are to be noted in the cities of each class. Reading from left to right, schools of 21 to 25 recitations are being maintained in cities of every class.

Half of all of the high schools represented have more than 35 recitations per day. The conflict between the so-called demands of the community and the demands of the standardizing agencies present a much less difficult problem for solution in the high school having many recitations, than in the school having few recitations. It may be seen that hundreds of these cities might be able to offer widely diversified courses of study without increasing the number of daily recitations at all. The factor of imitation, however, is so strong that pupils tend to elect the same courses so that no doubt thousands of these recitations are merely duplicate "sections" in the same subject.

TABLE XI

No. Daily Recitations per School	A	B	C	D	E	F	G
	Under 2,500	2,501 to 5,000	5,001 to 7,500	7,501 to 10,000	10,001 to 15,000	15,001 to 50,000	50,001 and Over
15.....	2	4	1	.....	.....	.....	.....
16- 20.....	13	1	4	1	2	.....	2
21- 25.....	26	31	12	1	2	2	2
26- 30.....	11	44	17	4	2	2	.....
31- 35.....	9	30	23	5	5	4	1
36- 40.....	5	24	11	8	7	1	1
41- 45.....	4	9	11	6	7	8	.....
46- 50.....	1	3	12	10	7	1	3
51- 55.....	.....	3	4	8	5	7	.....
56- 60.....	.....	1	4	2	6	6	1
61- 65.....	.....	.....	1	3	6	3	2
66- 70.....	.....	.....	.....	2	4	5	.....
71- 75.....	.....	.....	.....	4	1	7	1
76- 80.....	.....	.....	.....	2	1	3	.....
81- 85.....	.....	.....	.....	1	3	3	.....
86- 90.....	.....	.....	.....	.....	1	5	.....
91- 95.....	.....	.....	.....	.....	1	3	1
96-100.....	.....	.....	.....	.....	.....	4	1
101-105.....	.....	.....	.....	.....	.....	4	.....
106-110.....	.....	.....	.....	.....	1	.....	.....
111-115.....	.....	.....	.....	.....	.....	.....	2
116-120.....	.....	.....	.....	.....	.....	1	.....
121-130.....	.....	.....	.....	.....	.....	4	1
131-140.....	.....	.....	.....	.....	.....	2	.....
141-150.....	.....	.....	.....	.....	.....	1	4
151-175.....	.....	.....	.....	.....	.....	.....	1
176-190.....	.....	.....	.....	.....	.....	1	1
191-200.....	.....	.....	.....	.....	.....	.....	3
201-225.....	.....	.....	.....	.....	.....	.....	4
226-345.....	.....	.....	.....	.....	.....	.....	1
	71	150	100	57	61	77	32

Median for all—35.

Table XII shows the standard number of recitations offered in the towns of various sizes (based on medians).

TABLE XII  
STANDARD NUMBER OF RECITATIONS BASED ON POPULATION

	CLASS OF TOWN						
	A	B	C	D	E	F	G
No. of cases.....	71	150	100	57	61	77	32
Median No. Daily Recitations ...	23	29	34	47	49	70	107

*Number of daily recitations taught by the teachers.*—In view of the standard set up by the North Central Association recommending that no teacher teach more than five recitations a day and prohibiting a teacher from teaching more than six recitations a day, it is interesting to note the wide variations that exist in the actual number taught. Table XIII

TABLE XIII

Total No. of Daily Recitations	Under 2,500	2,501 to 5,000	5,001 to 7,500	7,501 to 10,000	10,001 to 15,000	15,001 to 50,000	50,001 and Over	Total
1.....	7	24	16	12	15	19	6	100
2.....	12	23	29	11	25	33	17	150
3.....	21	48	38	20	33	73	22	265
4.....	62	111	132	40	76	156	44	621
5.....	135	341	273	198	263	567	419	2,196
6.....	121	348	216	171	208	249	204	1,515
7.....	1	5	4	5	2	10	2	29
8.....	.....	1	.....	1	3	1	.....	6
9.....	.....	.....	.....	.....	.....	1	.....	1
	359	901	708	458	626	1,109	714	4,875

shows this variation, distributed for population of cities. This table becomes clear when read as follows: There are seven teachers in cities of 2,500 or under who have one recitation only; twelve with two recitations only; twenty-one with three recitations only, etc. It is to be noted that of the 359 cases in cities of this population the range of recitation taught by teachers is from one to seven. In cities of 2,500 to 5,000 the range is from one to eight, etc. The numbers in the right-hand column indicate the wide range of variation. There seems to be no great difference in this particular in the large and small cities, as the small city seems to be almost as likely to provide for a small number of daily recitations for each teacher as does the large city. The most frequent arrangement is for each teacher to teach five recitations, yet it should be noted that there are 1,136 teachers with fewer than five recitations and 1,541 teachers with more than five recitations. Indeed there are 36 teachers with more than six recitations, which is a *violation of the standard of the Association*. The exact number of recitations that each teacher should be asked to teach is still an unsolved problem. This is a question of importance not only on account of the financial cost involved, but because of its educational implication. The wide variation in practice suggests the desirability of comparing results attained by the systems using different plans.



*The superintendent as a teacher.*—Considerable interest has been shown in regard to the exact amount of teaching done by the superintendent. Table XIV shows the extent of teaching on the part of the superintendents throughout the states (Indiana not included in this table). It is to be noted that slightly over half of the 496 superintendents report the teaching of one or more recitations per day in the high school.

TABLE XIV

Total	Under 2,500	2,501 to 5,000	5,001 to 7,500	7,501 to 10,000	10,001 to 15,000	15,001 to 50,000	50,001 and Over
0.....	6	28	39	36	42	54	26
1.....	12	40	28	6	6	5	.....
2.....	22	47	14	3	3	4	1
3.....	18	12	4	.....	.....	.....	.....
4.....	9	9	6	3	2	.....	2
5.....	1	2	1	.....	1	1	1
6.....	.....	2	.....	.....	.....	.....	.....
	68	140	92	48	54	64	30
Percentages.....	91	80	57	25	32	15	13

In the 86 cities of 2,500 or under reporting, 12 superintendents teach one recitation, 22 teach 2 recitations, 18 teach 3 recitations, 9 teach 4, and 1 teaches 5, recitations. The same variation exists in cities of 2,501 to 5,000 population. So that there seems to be no definite policy in connection with the exact number of recitations to be taught each day by the superintendent in the smaller cities. As the cities grow larger a decreasing percentage of superintendents teach, as is shown by the decrease from 91 per cent to 13 per cent. At least two questions are involved in connection with the teaching done by the superintendent. One is the fact that the time which is given to teaching of necessity limits the amount of supervision possible in the high school or in the elementary school. This is of significance in view of the fact that such a large number of teachers are inexperienced. Surely the time spent in teaching by the superintendent is an important limitation in the matter of training teachers in service. On the other hand, the fact that superintendents do teach in the high school gives them a certain intimate contact with the high school which should be of value.

*State differences.*—Certain variations are to be observed in the percentage of superintendents who teach in the different states.

TABLE XV

State	Percentage of Superintendents Who Teach	State	Percentage of Superintendents Who Teach
Colorado.....	46	Missouri.....	35
Illinois.....	50	Nebraska.....	57
Iowa.....	40	North Dakota.....	73
Michigan.....	34	Ohio.....	25
Minnesota.....	48	Wisconsin.....	57

These differences in policy parallel somewhat closely the differences in the size of the high school. A larger percentage of superintendents teach in states with small high schools than in states with large high schools.

*Length of recitation period.*—A minimum standard of “40 minutes in the clear” for each recitation is set up by the Association. Wide variations exist in actual practice. Table XVI shows the length of the recitation period in minutes distributed for the various sized cities. Two well-defined modes appear in this table, 40 minutes and 45 minutes. There seems to be no relation between the size of cities and the length of recitation period as the central tendency and the variations are evenly distributed throughout the different-sized cities. Evidently factors

TABLE XVI

Total Length in Minutes	A	B	C	D	E	F	G
	Under 2,500	2,501 to 5,000	5,001 to 7,500	7,501 to 10,000	10,001 to 15,000	15,001 to 50,000	50,001 and Above
35.....	I						
39.....		I					
40.....	42	88	58	27	25	42	23
41.....		I		I			
42.....	5		I	I	I	2	5
42½.....	I	4	2	I			
43.....	2	10		2	I	I	7
44.....		2	2		I		2
45.....	20	56	47	38	37	51	29
47½.....						2	3
50.....	I						3
53.....					I		
55.....	I		I		I	I	I
60.....						I	
80.....			I				
	73	162	112	70	67	101	73

other than the pressure of the standards set up by the Association are at work, because over half of the cities provide a longer period. No striking differences are to be found among the different states in this particular.

*Large classes.*—The Association has sought to discourage large classes by setting thirty in a class as the maximum to be allowed. Many schools have violated this standard; the actual extent of this violation is shown in Table XVII. This table should be read thus: In cities of 2,500

TABLE XVII

Total No. Classes with Over 30 Pupils	A	B	C	D	E	F	G	Total
	Under 2,500	2,501 to 5,000	5,001 to 7,500	7,501 to 10,000	10,001 to 15,000	15,001 to 50,000	50,001 and Above	
0.....	55	115	69	49	36	49	30	403
1.....	7	18	17	9	9	7	3	70
2.....	7	13	20	5	7	13	7	72
3.....	2	3	5	1	6	14	3	33
4.....		1	1	1	3	4	1	11
5.....					3	6	3	12
6.....		1		2	2	2	2	9
7.....		2			1	1	2	6
8.....				1			1	2
9.....							1	1
10.....							2	1
11.....							1	2
12.....							1	1
13.....		1					1	1
14.....						1	1	2
15.....						1	1	2
20.....							2	2
22.....							1	2
30.....							1	1
31.....							1	1
32.....							1	1
91.....							1	1
116.....							1	1
	71	154	112	68	67	98	68	638

population or under, 55 have no classes enrolling more than 30 pupils; 7 have one class with more than 30; 7 have 2 classes with more than 30; 2 have 3 classes with more than 30. Cities of all sizes violate this standard, but the large cities are the worst offenders. Summarizing, it is seen that slightly over one-third of the cities violate the standard by having from 1 to 116 classes enrolling more than 30 pupils. In view of

this situation it would seem wise to do one of two things—either abolish the standard or revise it.

*Length of school year.*—The North Central Association makes a requirement that the school year shall be at least 36 weeks in length. Table XVIII shows the distribution in this particular. This table should

TABLE XVIII

Total No. Weeks	Under 2,500	2,501 to 5,000	5,001 to 7,500	7,501 to 10,000	10,001 to 15,000	15,001 to 50,000	50,001 and Over
32.....		I		I			
36.....	58	III	6I	44	27	30	7
37.....				I			I
38.....	12	33	34	6	25	4I	2I
39.....							
40.....	4	16	16	17	15	30	43(42-I)
	74	161	112	69	67	101	73

be read thus: Of the 74 cities with a population of 2,500 and under, 58 have a 36 weeks' term, 12 have a 38 weeks' term, and four have a 40 weeks' term, etc. Only two schools fail to reach the standard of the Association. On the other hand, over 300 schools are maintained for a period longer than required by the Association. Three well-defined modes appear, 36, 38, and 40 weeks. This is probably due to the fact that people customarily think of the school year in terms of months and half-months, rather than terms of weeks; and payments are usually made on the basis of an even number of weeks.

## INSTRUCTIONAL STAFF

*Sex of superintendents.*—In view of the increase in the number of women employed in the public schools, it is important to know the extent to which women have been selected to fill the executive positions in the schools of the North Central Association list. Table XIX shows the

TABLE XIX

Sex	Under 2,500	2,501 to 5,000	5,001 to 7,500	7,501 to 10,000	10,001 to 15,000	15,001 to 50,000	50,001 and Over
Male.....	70	159	108	68	62	95	66
Female.....	3	I	I	.....	I	3	I
	73	160	109	68	63	98	67

distribution of the superintendents as to sex. This table should be read as follows: Of the 73 cities of 2,500 or under, 70 of the superintendents are men and 3 are women, etc. Out of the 637 superintendencies listed for sex, only 10 are filled by women.

*Sex of high-school principals.*—High-school principalships have attracted women in greater numbers than have city-school superintendencies. Table XX shows the exact distribution of high-school principalships as to sex. This table should be read as follows: Of the 73

TABLE XX

Sex	Under 2,500	2,501 to 5,000	5,001 to 7,500	7,501 to 10,000	10,001 to 15,000	15,001 to 50,000	50,001 and Over
Male.....	41	107	89	57	57	92	65
Female.....	32	50	17	11	8	5	2
	73	157	106	68	65	97	67

cities with a population of 2,500 or under, 41 employ male, and 32 employ female principals. Of the cities of 2,501 to 5,000 population, 107 employ male principals and 50 employ female principals. Out of a total of 643 principalships, 125 women are employed, which is in striking contrast to the number of women employed as superintendents, in the same cities. However, certain differences are to be noted in the cities of the different sizes; the small city of 2,500 or under employs more than half of all of the women principals at work in these schools. Table XXI shows the percentage of women employed as principals in the different-sized cities. This table should be read thus: In cities of 2,500 or under, 43 per cent of the principals are women, etc. From these figures it would seem that the positions of larger responsibility as measured by the population of the city in which the high school is located are not filled by women. This may be due to the attitude of the women themselves or to the attitude of the communities.

TABLE XXI

	Under 2,500	2,501 to 5,000	5,001 to 7,500	7,501 to 10,000	10,001 to 15,000	15,001 to 50,000	50,001 and Over
Percentage women principals.....	43	31	16	16	12	5	3



*Sex of high-school teachers.*—The high schools in this territory have attracted women as teachers in far greater numbers than as principals. The exact extent of this is shown in Table XXII. This table becomes

TABLE XXII

Sex	Under 2,500	2,501 to 5,000	5,001 to 7,500	7,501 to 10,000	10,001 to 15,000	15,001 to 50,000	50,001 and Over
Male.....	71	274	220	215	241	524	406
Female.....	292	646	561	414	444	887	708
	363	920	781	629	685	1,411	1,114

clear when read as follows: Of the 363 teachers employed in cities of 2,500 or under, 71 are men and 292 are women; of the 922 teachers employed in towns of 2,501 to 5,000, 226 are men and 646 are women, etc.

Out of a total of 6,303 teachers, 69 per cent are women. However, differences are to be noted here also in connection with the larger percentage in the smaller cities as is shown by Table XXIII. This table should be read thus: In cities of 2,500 or less 80 per cent of the teachers are women, etc. Summarizing the data for sex distribution of superintendents, high-school principals, and high-school teachers it can be said that at present the women are rarely to be found in the field of supervision; that about one-fourth of the principalships chiefly in the smaller towns are filled by women; and that over two-thirds of the teaching positions are filled by women, although the proportion of women is considerably higher in the smaller than in the larger cities.

TABLE XXIII

	Under 2,500	2,501 to 5,000	5,001 to 7,500	7,501 to 10,000	10,001 to 15,000	15,001 to 50,000	50,001 and Over
Percentage of women.....	80	70	71	66	65	62	63

*Salaries of superintendents in schools represented.*—Table XXIV shows the salaries paid to the superintendents of the schools distributed on a basis of population of cities concerned. In the 66 cities of 2,500 and under reporting on this item there is a wide variation. Three cities pay

TABLE XXIV

Total Salary of Superintendents	Under 2,500	2,501 to 5,000	5,001 to 7,500	7,501 to 10,000	10,001 to 15,000	15,001 to 50,000	50,001 and Over
\$1,000.....					1		
\$1,001-\$1,100...	3						
1,101-1,200...	6	3					
1,201-1,300...	7	11	5				
1,301-1,400...	10	14	3			1	
1,401-1,500...	19	25	8	1	1		
1,501-1,600...	8	29	12	2	2		
1,601-1,700...	5	20	9	3	2		
1,701-1,800...	2	15	29	13	2	1	
1,801-1,900...		5	3	5			
1,901-2,000...	3	8	16	19	13	5	
2,001-2,100...		4	2	4	6	4	
2,101-2,200...	1	2	4	5	8	11	
2,201-2,300...	1			1	4	3	1
2,301-2,400...				1	2	5	
2,401-2,500...			2	4	3	14	
2,501-2,600...			1		1	8	
2,601-2,700...	1			1	4	6	
2,701-2,800...		1	1		2	3	
2,801-2,900...						1	
2,901-3,000...		1		1	5	13	5
3,001-3,200...						1	
3,201-3,300...						6	1
3,301-3,500...				2		2	4
3,501-4,000...							4
4,001-4,500...							3
4,501-5,000...							11
5,001-5,800...							2
5,801-6,000...							16
6,001-7,000...							5
7,001-10,000...							1
Median.....	66 \$1,500*	138 \$1,600	95 \$1,800	62 \$2,000	56 \$2,500	84 \$5,000	53

\*From \$1,401 to \$1,500, etc.

\$1,001 to \$1,100; six, \$1,101 to \$1,200; seven, \$1,201 to \$1,300; while one pays \$2,700. The same variation is found in the larger cities.

*Salaries of principals.*—Table XXV shows the salaries paid to the high-school principal, distributed on a basis of population of city concerned. (Data are lacking for Colorado.) In the 67 towns of 2,500 or under reporting on this item there is a wide variation. Four cities pay \$601 to \$650; three, \$651 to \$700; six, \$701 to \$750; while one pays \$2,000. The same variation is found in the larger cities.

TABLE XXV

Total Salary of Principals	Under 2,500	2,501 to 5,000	5,001 to 7,500	7,501 to 10,000	10,001 to 15,000	15,001 to 50,000	50,001 and Over
\$ 600 .....						1	
\$ 601-\$ 650...	4			1			
651- 700...	3	7	2				
701- 750...	6	11	1				
751- 800...	16	13	5		1		
801- 850...	4	5	3				
851- 900...	7	18	7	2	1		
901- 950...	1	3	1				
951- 1,000...	5	19	12	1	2		
1,001- 1,050...		1	5	1			
1,051- 1,100...	2	13	14	8	3		1
1,101- 1,150...		1			1		
1,151- 1,200...	5	12	25	13	10	1	1
1,201- 1,250...			3	2	2		
1,251- 1,300...	1	4	7	12	7	1	
1,301- 1,400...	4	2	2	7	7	8	1
1,401- 1,500...	6	7	1	7	8	12	
1,501- 1,600...		7	2	2	5	13	2
1,601- 1,700...	2	7	3			5	
1,701- 1,800...	1	7	4	1	5	15	2
1,801- 1,900...		1		3	1	5	2
1,901- 2,000...	1	2	3		3	15	2
2,001- 2,100...				3		2	1
2,101- 2,200...		1	1	1		5	6
2,201- 2,300...			1		1	1	
2,301- 2,400...						1	3
2,401- 2,500...						5	3
2,501- 2,600...							1
2,601- 2,700...		1	1				
2,701- 2,800...							1
2,801- 2,900...							2
2,901- 3,000...			1			1	24
3,001- 3,500...				1		3	8
3,501- 4,000...			1				2
4,001- 4,500...							
4,501- 5,000...							
	67	142	105	63	57	94	62
Median.....	\$850*	\$1,000	\$1,100	\$1,300	\$1,400	\$1,800	\$3,000

\*From \$801 to \$850, etc.

*Maximum salary of teachers.*—Table XXVI shows the maximum salaries paid to the high-school teachers, distributed on a basis of population of cities concerned. (Data for Colorado are lacking.) In the 70 cities of 2,500 population or under there is a wide variation in maximum

TABLE XXVI

Total Maximum Salary	Under 2,500	2,501 to 5,000	5,001 to 7,500	7,501 to 10,000	10,001 to 15,000	15,001 to 50,000	50,001 and Over
\$ 500 .....			1				
\$ 501-\$ 550...	2	3					
551- 600...	2	6	2		2		
601- 650...	10	13	8	1			
651- 700...	11	17	8	2			
701- 750...	13	35	11	3	5		
751- 800...	10	17	20	4	5	1	
801- 850...	7	14	10	8	2	1	
851- 900...	3	16	11	13	7	9	
901- 950...	1	5	3	5	1	7	
951- 1,000...	4	6	15	16	10	13	1
1,001- 1,050...			2			4	
1,051- 1,100...	1	3	6	3	8	7	2
1,101- 1,150...		1			1	3	
1,151- 1,200...	4	2	4	3	7	11	5
1,201- 1,250...	1	1	1	2	2	1	
1,251- 1,300...			1	3	2	11	2
1,301- 1,400...		1	1		3	11	6
1,401- 1,500...		2	1		2	7	9
1,501- 1,600...				3	1	1	7
1,601- 1,700...					2	2	1
1,701- 1,800...				1	1	4	7
1,801- 1,900...							3
1,901- 2,000...	1	1				2	9
2,001- 2,100...							5
2,101- 2,200...							3
2,201- 2,300...							2
2,301- 2,400...							1
2,401- 2,500...							1
2,501- 2,600...							
	70	143	100	67	61	95	64
Median salary...	\$750*	\$750	\$850	\$950	\$1,100	\$1,150	\$1,600

\* From \$701 to \$750, etc.

salary paid. Ten cities pay a maximum salary of \$501 to \$550; ten, \$551 to \$600; ten, \$601 to \$650; while one pays \$2,000. Similar variations are found in the larger cities. Of the cities of 50,000 or over the maximum varies from \$1,000 to \$2,500.

*Minimum salary of teachers.*—Table XXVII shows the minimum salary paid to the high-school teachers, distributed on the basis of cities concerned. (Data for Colorado are not included.)

In the 70 cities of 2,500 population and under, there is a wide variation in the minimum salary paid. Thirteen cities pay not less than

TABLE XXVII

Total Minimum Salary	Under 2,500	2,501 to 5,000	5,001 to 7,500	7,501 to 10,000	10,001 to 15,000	15,001 to 50,000	50,001 and Over
\$ 300.....	.....	.....	.....	.....	.....	1	.....
\$ 301-\$ 450.....	.....	5	.....	.....	.....	.....	.....
451- 500...	13	11	4	4	1	2	1
501- 550...	21	24	18	6	4	4	.....
551- 600...	12	41	22	11	11	8	5
601- 650...	10	28	26	9	12	10	2
651- 700...	10	14	19	13	13	23	7
701- 750...	2	10	11	15	10	18	10
751- 800...	1	3	1	4	4	17	9
801- 850...	1	4	.....	.....	3	5	7
851- 900.....	.....	2	4	2	1	2	5
901- 950.....	.....	.....	.....	1	1	.....	.....
951- 1,000.....	.....	2	.....	.....	.....	2	11
1,001- 1,050.....	.....	.....	.....	.....	.....	1	.....
1,051- 1,100.....	.....	.....	.....	.....	.....	.....	1
1,101- 1,200.....	.....	.....	1	.....	.....	.....	1
1,201- 1,300.....	.....	1	.....	.....	.....	.....	.....
Median salary...	70 \$600*	145 \$600	106 \$650	65 \$700	60 \$700	93 \$700	59 \$800

\*From \$551 to \$600, etc.

\$500; 21 pay not less than \$501 to \$550; 12 pay not less than \$551 to \$600; while one city pays not less than \$801 to \$850. The same variation is to be noted in the larger cities. For example, cities of 50,000 or over have a minimum salary as low as \$500 and as high as \$1,200.

A summary of the median salaries shown in the foregoing tables brings out the salary differences in a striking manner (Table XXVIII). This table should be read thus: In the cities of 2,500 or under, the

TABLE XXVIII

	CLASS OF CITY						
	A	B	C	D	E	F	G
Median salary of superintendent.....	\$1,500*	\$1,600	\$1,800	\$2,000	\$2,000	\$2,500	\$5,000
Median salary of high-school principals.....	850*	1,000	1,100	1,300	1,400	1,800	3,000
Median maximum salary of high-school teachers	750*	750	850	950	1,100	1,150	1,600
Median minimum salary of high-school teachers	600*	600	650	700	700	700	800

\*In the \$1,500 group, etc.



median salary of the superintendent is \$1,401 to \$1,500; the median salary of the high-school principal is \$801 to \$850; the median maximum salary of the high-school teacher is \$701 to \$750; the median minimum salary of the high-school teacher is \$551 to \$600, etc.

Comparison between the minimum and maximum salaries of the teachers and the high-school principals brings out the fact that there is less difference in the small cities than in the large cities. The small city offers fewer chances for a high salary reward in going from a minimum salary to a maximum salary. The median increase from minimum to maximum in the small city is only 20 per cent, while in the large city the increase is 100 per cent. The opportunity for a high salary in case of a change from a teaching position to a principalship or to a superintendency is likewise very much less in the small community. Despite the fact that the minimum salary of the large city is only slightly higher than in the small city, the teacher who goes to the large town has a very much better chance for promotion to higher salaries, either as teacher or as an executive. These facts no doubt contribute to the difference in experience and tenure which exists in the large cities and in the small cities. Increase in salary seems to be gained by a shift from small city to large city in each type of educational activity represented above, as there is a positive correlation with salary and size of town. It would be difficult to justify this procedure in view of the actual needs of the schools or the difficulty of the tasks. The small community has, within recent years, been buying the best in the way of school buildings and library equipment. It is possible that the difference in salaries could be so adjusted as to offer such inducements to the ambitious beginning teachers that they would not be constantly drawn off to the larger cities. Something might be said in favor of the French plan whereby the difference in salaries between the large and small community is supposed to be about enough to offset the differences in living expense, such as rentals and taxes.

*Total experience of the high-school teacher.*—The total experience of the high-school teachers in the best high schools in this territory is of significance on account of the fact that it is assumed that a teacher becomes proficient largely by experience. Therefore, it is important to know the extent of experience in order that we may know something of the amount of proficiency we have a right to expect.

TABLE XXIX

Total No. Years	Under 2,500	2,501 to 5,000	5,001 to 7,500	7,501 to 10,000	10,001 to 15,000	15,001 to 50,000	50,001 and Over
1.....	72	172	135	117	84	192	91
2.....	84	153	122	77	75	114	56
3.....	61	121	84	78	66	131	52
4.....	57	102	89	62	69	122	83
5.....	36	64	65	48	60	121	74
6.....	8	79	58	33	48	98	59
7.....	17	54	62	40	41	84	65
8.....	23	45	30	21	36	80	54
9.....	17	28	42	30	29	59	45
10.....	14	44	36	24	28	60	52
11.....	10	28	33	15	24	44	46
12.....	10	36	21	16	5	27	30
13.....	7	20	22	11	11	36	38
14.....	4	15	21	12	15	29	42
15.....	7	24	13	15	19	27	37
16.....	9	17	14	8	10	20	25
17.....	2	11	7	9	7	14	32
18.....	7	9	14	10	11	24	28
19.....	2	16	7	5	1	10	15
20.....	2	16	9	10	12	18	21
21.....	3	13	8	4	9	8	18
22.....	.....	7	5	5	6	13	17
23.....	2	3	2	8	4	12	8
24.....	4	5	7	4	2	7	13
25.....	.....	5	3	5	7	10	14
26.....	.....	13	4	5	9	8	8
27.....	4	3	4	2	6	4	15
28.....	2	4	.....	1	1	7	5
29.....	.....	3	4	3	2	2	1
30.....	.....	.....	4	3	4	4	7
31.....	1	3	.....	4	2	2	7
32.....	.....	3	.....	1	1	5	4
33.....	.....	.....	2	.....	.....	5	7
34.....	.....	3	5	.....	.....	.....	5
35.....	.....	1	1	.....	1	4	5
36.....	.....	1	2	1	.....	2	9
37.....	.....	.....	1	2	.....	4	.....
38.....	1	1	1	.....	2	1	1
39.....	.....	1	.....	.....	1	2	2
40.....	.....	1	.....	.....	1	.....	1
41.....	.....	2	1	.....	.....	.....	5
43.....	.....	.....	2	1	.....	.....	1
47.....	.....	.....	.....	.....	.....	.....	1
49.....	.....	.....	.....	.....	.....	1	.....
50.....	.....	.....	.....	.....	.....	.....	1
52.....	.....	.....	.....	.....	.....	.....	1
56.....	.....	.....	.....	.....	.....	1	.....
	466	1,172	940	690	709	1,512	1,111

Table XXIX shows the distribution of the number of teachers in relation to the total number of years' experience in teaching (irrespective of the type of school in which experience was gained). This table should be read as follows: Of the 466 teachers in cities of 2,500 or under, 72 have had one year or less of experience; 84, two years of experience; 61, three years' experience, etc. These figures reveal the wide variation that exists in the matter of the total number of years of experience in teaching.

The immaturity and lack of wide experience is shown by the fact that 13 per cent of these teachers have had one year's experience; 20 per cent have had two years' experience or less; 29 per cent have had three years' experience or less.

TABLE XXX  
MEDIAN YEARS OF EXPERIENCE

	CLASS						
	A	B	C	D	E	F	G
Number.....	466	1,172	940	690	709	1,572	1,111
Median years....	3+	4+	4+	4+	5+	5+	8+

Another way of looking at this same problem is shown in Table XXX. This table should be read as follows: Of the 466 teachers in cities of 2,500 or under, one-half have had three years' or less experience; half in the cities of 2,501 to 5,000 have had four years' or less experience, etc. The median experience ranges from three to eight years, the more experienced teachers being in the larger cities.

In view of the greater salary opportunities in the larger cities it is what we should expect. The cities which offer the greatest opportunity for promotion from minimum to maximum salaries are able to secure a group of teachers with a median experience about twice as large as that found in the smaller cities. It should be borne in mind that the superintendents in the smaller cities spend considerable of their time in teaching; consequently they are even less able to give adequate supervision for their relatively inexperienced teachers than are superintendents in the larger cities. This lack of supervision is even more serious in consideration of the fact that the communities employing the less experienced teachers necessarily employ a much larger proportion of teachers who are not fully given over to teaching as a profession than do communities employing teachers of much experience.

TABLE XXXI

Total	Under 2,500	2,501 to 5,000	5,001 to 7,500	7,501 to 10,000	10,001 to 15,000	15,001 to 50,000	50,001 and Over
0.....	248	474	436	237	329	614	439
1.....	40	139	108	80	91	202	117
2.....	45	102	71	81	60	132	87
3.....	29	82	60	42	49	75	58
4.....	22	52	42	31	32	54	49
5.....	18	44	51	33	28	56	52
6.....	9	28	28	24	18	40	40
7.....	9	27	16	8	18	28	37
8.....	11	14	16	14	10	27	21
9.....	3	7	15	15	14	19	19
10.....	2	11	16	11	5	27	30
11.....	2	15	5	3	11	19	18
12.....	5	6	4	8	5	14	15
13.....	2	7	7	4	9	20	15
14.....	1	3	2	7	7	5	15
15.....	2	8	2	8	6	6	9
16.....	1	4	6	5	7	8	10
17.....		3	2	5	4	5	6
18.....	1	3	3	7	3	5	6
19.....	1	2	7	2	1	10	8
20.....		3	2	3	3	5	8
21.....		1		5	1	7	6
22.....		3	1	2	1	1	6
23.....				1	2	4	4
24.....		2	1	1	1	3	5
25.....				2		2	3
26.....					1	3	
27.....		1		1	1	2	2
28.....			2	1	1	3	
29.....		2			1	1	1
30.....				1	1	4	2
31.....		1		1		1	
32.....			2	1			1
33.....							1
34.....			1			1	
35.....				1			2
36.....							1
37.....							1
39.....						2	1
40.....							1
41.....				1			1
42.....							1
44.....				1			
47.....	1						
51.....			1				
Median.....	461 0	1,044 1	907 1	647 1	719 1	1,405 1	1,098 1

The small community is constantly serving as a practice school for the large communities. After a little experience in the small community

the more ambitious are attracted to the larger places. A part of the remainder change occupation, and a small part of the group remain in the small cities.

*Experience in high schools.*—It is not infrequently said that one of the difficulties which high-school teachers have in dealing with the problems of the high school is that the teachers are not familiar with the work which is done in the elementary school. Table XXXI shows the exact amount of experience which the high-school teachers have had in non-secondary schools. This table should be read as follows: Of the 461 teachers working in cities of 2,500 or under, 248 had no experience in non-secondary schools; 49 had one year's experience in non-secondary schools; 45 had two years' experience, etc. There were 44 per cent of the teachers who had no experience in other than high-school work; 56 per cent had one year or less experience in other than secondary schools. The median teacher in cities of 2,500 or under had no experience in a non-secondary school. The median teacher in cities of larger size has had one year experience in a non-secondary school. Certainly the superintendent and high-school principal cannot rely upon this as a means of furnishing information to the teachers in the high school of the work that has been done in the grades. This table points to the necessity of the high-school principal or the superintendent giving specific instruction to the high-school teachers in regard to the work in the lower grades. On the other hand, this table indicates that a teacher who expects to teach in the high school need feel no fear of failure of getting a position without experience in non-secondary schools. There is no well-defined demand for this experience in high schools of any type.

#### TRAINING OF TEACHERS

*Teachers who are not college graduates.*—The North Central Association has for years had a requirement that the teachers in approved schools should be college graduates or the "equivalent." The points of equivalency have not been standardized to any considerable degree. Very striking differences exist, however, in different schools in the proportion of the teaching staff who are presumably "equivalent" to college graduates. Table XXXII shows the complete distribution for 592 schools reporting on this item. This table becomes clear when read as follows: Of the 70 schools in cities of a population of 2,500 or under, 33 employ no teachers who are not college graduates; 10 employ 1



teacher who is not a college graduate; 17 employ 2 teachers who are not college graduates; 5 employ 3 such teachers; 1 employs 4 such teachers; 3 employ 5 such teachers; 1 employs 6 such teachers, etc. From this table it is seen that about three schools out of four employ one or more teachers who are not college graduates. However, differences between the small city and large city are very marked in this particular, almost

TABLE XXXII

No. Not Graduates	Under 2,500	2,501 to 5,000	5,001 to 7,500	7,501 to 10,000	10,001 to 15,000	15,001 to 50,000	50,001 and Over	No. of Teachers
0.....	33	42	22	13	7	10	6	.....
1.....	10	43	31	15	10	8	3	120
2.....	17	28	23	13	16	12	8	234
3.....	5	16	11	14	13	12	4	225
4.....	1	5	6	5	2	12	2	132
5.....	3	3	4	.....	3	7	1	105
6.....	1	2	1	2	4	7	2	114
7.....	.....	.....	1	3	1	7	6	126
8.....	.....	2	3	.....	1	5	3	112
9.....	.....	1	.....	.....	.....	4	3	72
10.....	.....	.....	1	.....	1	3	5	100
11.....	.....	.....	.....	.....	1	.....	3	44
12.....	.....	.....	.....	1	.....	.....	3	48
13.....	.....	.....	.....	1	.....	.....	3	52
14.....	.....	.....	.....	.....	.....	.....	1	28
15.....	.....	.....	.....	.....	.....	.....	1	30
16.....	.....	.....	.....	.....	.....	.....	1	32
17.....	.....	.....	.....	.....	.....	1	.....	17
18.....	.....	.....	.....	.....	.....	1	.....	18
20.....	.....	.....	.....	.....	.....	1	.....	20
23.....	.....	.....	.....	.....	.....	.....	1	23
24.....	.....	.....	.....	.....	.....	.....	1	24
27.....	.....	.....	.....	.....	.....	.....	1	27
31.....	.....	.....	.....	.....	.....	.....	1	31
46.....	.....	.....	.....	.....	.....	.....	1	46
50.....	.....	.....	.....	.....	.....	.....	1	50
	70	142	103	67	59	90	61	1,776

half of the cities of 2,500 and under have no teachers who are not college graduates; while only one-tenth of the cities of 50,000 or over have no teachers who are not graduates of college. The fact that the large cities have teachers with much longer experience may mean that these teachers have been in the school system since the school was first placed on the list or it may mean that long experience in a good school system has come to stand for the "equivalent" of college graduation. It may be that the

small school feels a greater necessity for meeting the technical requirements of the Association in its every detail in an unquestioned manner than does the large school.

The 1,776 teachers who are reported as non-college graduates represent about one-fifth of the total number teaching in these schools. The great majority of these teachers are employed in the larger cities. Reference to the last column to the right indicates that some cities have as many as 50 teachers in their employ who are not graduates.

*Teachers who are graduates of college.*—Table XXXIII shows the distribution of the number of college graduates in the various high schools. The meaning of this table becomes clear when read as follows: Of the 72 cities with a population of 2,500 or under, one has 2 college graduates; 6 have 3 college graduates; 16 have 4 college graduates; 20 have 5 college graduates; 16 have 6 college graduates, etc. There are 6,491 college graduates reported as being employed in these schools.

The material found in this table in connection with that dealing with non-college graduates indicates the extent to which college graduation has become a standardized requirement for high-school teachers in the North Central territory. There seems to be only about one chance in five of a position being filled by a non-college graduate. For an inexperienced teacher the chance is probably very much less, so that it would seem safe to say that despite the fact that there are many non-graduates holding good positions the chance is very poor for a teacher who starts in today without being a college graduate.

*Professional and academic schooling of the teacher.*—The data showing the details of training for 7,045 teachers were distributed in order to find out the exact type and length of preparation made by the teachers. It was found that 1,040 of these teachers had received their education in normal school only; 5,109 in college and university only; and that 946 had taken a combined course in normal college or university.

Table XXXIV shows the number of years of training for the teachers who have done normal-school work only. This table should be read thus: In cities of 2,500 or under, 16 teachers were employed who had only one year of normal training; 29 with two years of normal training only; 7 with three years of normal training only; 26 with four years of normal training only; 4 with five years of normal training only. Reference to the right-hand column indicates that 187 of these teachers had

TABLE XXXIII

No.	Under 2,500	2,501 to 5,000	5,001 to 7,500	7,501 to 10,000	10,001 to 15,000	15,001 to 50,000	50,001 and Over	No. of Teachers
2.....	1	4	1	.....	.....	.....	.....	12
3.....	6	7	3	1	1	.....	1	57
4.....	16	26	9	1	.....	.....	1	212
5.....	20	37	18	5	3	2	1	480
6.....	16	33	22	9	3	2	3	528
7.....	9	24	18	13	15	8	1	616
8.....	2	20	17	12	8	5	2	528
9.....	1	3	7	6	10	8	3	342
10.....	1	1	7	4	4	4	1	220
11.....	.....	2	4	5	5	5	2	253
12.....	.....	.....	2	3	9	11	.....	240
13.....	.....	1	2	4	3	3	2	195
14.....	.....	.....	.....	2	1	7	2	168
15.....	.....	.....	.....	2	1	5	.....	120
16.....	.....	.....	.....	1	.....	5	.....	96
17.....	.....	.....	.....	.....	2	1	.....	51
18.....	.....	.....	.....	.....	.....	5	1	108
19.....	.....	1	.....	.....	1	7	.....	171
20.....	.....	.....	.....	1	.....	4	5	200
21.....	.....	.....	.....	.....	.....	3	.....	63
22.....	.....	.....	.....	.....	.....	3	4	88
23.....	.....	.....	.....	.....	.....	1	.....	23
24.....	.....	.....	.....	.....	.....	.....	1	24
25.....	.....	.....	.....	.....	.....	2	1	75
26.....	.....	.....	.....	.....	.....	2	1	32
28.....	.....	.....	.....	.....	.....	1	3	112
29.....	.....	.....	.....	.....	.....	.....	3	87
30.....	.....	.....	.....	1	1	.....	3	150
31.....	.....	.....	.....	.....	.....	1	1	62
32.....	.....	.....	.....	.....	.....	.....	.....	32
33.....	.....	.....	.....	.....	.....	.....	1	33
34.....	.....	.....	.....	.....	.....	1	3	136
36.....	.....	.....	.....	.....	.....	1	1	72
39.....	.....	.....	.....	.....	.....	1	1	78
40.....	.....	.....	.....	.....	.....	.....	2	80
42.....	.....	.....	.....	.....	.....	.....	1	44
44.....	.....	.....	.....	.....	.....	.....	1	44
47.....	.....	.....	.....	.....	.....	1	1	94
48.....	.....	.....	.....	.....	.....	.....	2	96
49.....	.....	.....	.....	.....	.....	.....	1	49
50.....	.....	.....	.....	.....	.....	.....	1	50
51.....	.....	.....	.....	.....	.....	.....	1	51
53.....	.....	.....	.....	.....	.....	.....	1	53
58.....	.....	.....	.....	.....	.....	.....	1	58
60.....	.....	.....	.....	.....	.....	.....	1	60
68.....	.....	.....	.....	.....	.....	.....	1	68
	72	159	110	70	67	98	62	6,491

TABLE XXXIV  
NORMAL SCHOOL ONLY

Total Years in Normal	Under 2,500	2,501 to 5,000	5,001 to 7,500	7,501 to 10,000	10,001 to 15,000	15,001 to 50,000	50,001 and Over	Total Number
1.....	16	18	22	25	35	32	39	187
2.....	29	61	51	31	65	75	34	386
3.....	7	32	35	20	26	39	27	256
4.....	26	51	28	6	27	32	14	184
5.....	4	7	3	2	1	2	2	21
6.....					1			1
7.....							5	5
	82	171	140	85	155	182	121	1,040

one year of normal training only; 386, two years only, etc. One striking fact that comes out clearly is that four-fifths of these people have studied less than four years in normal school.

Table XXXV shows the range of distribution for teachers who have received their training in college and university. Of the 382 teachers at work in cities of 2,500 or under, 17 had one year of college or university work alone; 36 had two years; 32, three years; 259, four years, etc. Reference to the right-hand column reveals the fact that 193 had one year only of college or university training; 985, or less than one-fifth, of these people have had less than a four-year course. On the other hand,

TABLE XXXV  
COLLEGE OR UNIVERSITY ONLY

Total Years in University	Under 2,500	2,501 to 5,000	5,001 to 7,500	7,501 to 10,000	10,001 to 15,000	15,001 to 50,000	50,001 and Over	Total Number
1.....	17	31	28	19	23	32	43	193
2.....	26	47	64	39	53	88	61	379
3.....	32	64	54	40	54	91	78	413
4.....	259	667	426	362	428	690	489	3,321
5.....	35	99	64	77	75	158	115	433
6.....	7	26	26	18	22	49	50	268
7.....	2	10	7	5	3	17	23	67
8.....	2	3	1		2	1	11	20
9.....	2	2	1		2	2	1	10
10.....							3	3
12.....		1				1		2
	382	950	671	560	662	1,129	874	5,109

790, or almost one-sixth, of these people have had more than four years' training. The latter figure is an indication of the extent of advanced preparation.

Table XXXVI shows the distribution of the teachers who have had training both in normal and college or university courses. Of the 46 cities of 2,500 and under having teachers who have had a combined normal

TABLE XXXVI  
COMBINED NORMAL AND COLLEGE OR UNIVERSITY COURSE

TOTAL YEARS		UNDER 2,500	2,501 TO 5,000	5,001 TO 7,500	7,501 TO 10,000	10,001 TO 15,000	15,001 TO 50,000	50,001 AND OVER	TOTAL
Normal	College								
2	1...	1	8	7	4	5	5	5	34
3	1...	2	1	7	10	4	4	14	52
	2...	1	2	14	7	7	8	15	62
	3...	1	1	7	5	4	5	9	37
4	2...	2	9	24	14	13	12	27	104
	3...	1	1	10	5	7	10	12	49
	4...	1	4	11	8	9	14	18	73
5	2...	3	4	9	6	5	9	10	53
	3...	1	4	13	10	5	5	12	62
	4...	1	5	12	11	7	4	7	54
6	5...	1	3	4	.....	3	3	7	25
	2...	4	7	15	8	4	8	9	53
	3...	3	1	11	2	4	6	11	51
7	4...	2	.....	6	8	5	11	16	55
	5...	1	1	1	5	1	1	1	12
	6...	1	.....	2	1	.....	2	.....	6
8	2...	5	1	1	2	.....	1	3	11
	3...	4	.....	4	.....	6	3	6	22
	4...	3	.....	9	5	2	7	12	45
9	5...	1	.....	1	1	.....	1	.....	2
	6...	2	.....	1	.....	1	.....	1	4
	7...	1	.....	2	.....	.....	1	1	4
10	2...	6	.....	.....	1	1	.....	2	4
	3...	4	1	7	6	3	3	5	31
	4...	3	.....	2	.....	1	.....	2	5
11	5...	3	1	1	1	.....	1	1	6
	6...	6	.....	1	.....	.....	.....	.....	1
	7...	7	.....	.....	.....	.....	.....	.....	.....
12	2...	4	.....	.....	.....	.....	.....	.....	.....
	3...	5	.....	.....	.....	.....	.....	.....	.....
	4...	9	.....	.....	.....	.....	.....	.....	.....
13	5...	4	.....	.....	.....	.....	.....	.....	.....
	6...	5	.....	.....	.....	.....	.....	.....	.....
	7...	8	.....	.....	.....	.....	.....	.....	.....
14	2...	12	.....	.....	.....	.....	.....	.....	.....
	3...	.....	.....	.....	.....	.....	.....	.....	.....
	4...	.....	.....	.....	.....	.....	.....	.....	.....
		46	188	125	94	127	195	137	936



and university course, 1 has gone to normal school only one year and to college two years; 2 to normal school two years and one year to college; 1 to normal school one year and three years to college; 9 to normal two years and to college two years; 1 went three years to normal and one year to college; 4 went one year to normal and four to college; 4 had two years in normal and three years in college; 4 had three years in normal and one year in college, etc.

Reference to the right-hand column indicates that almost 150, or about one-sixth, of these teachers have had less than four years of combined work in the normal and college or university course. On the other hand, 500, or over half, have had more than four years' combined preparation.

Table XXXVII shows the total distribution of the training of teachers in the different-sized cities. This table should be read as

TABLE XXXVII

	CLASS OF TOWN							
	A	B	C	D	E	F	G	Total
Normal only.....	82	171	140	85	155	182	121	1,040
College or university.....	382	950	671	560	662	1,129	874	5,059
Combined.....	46	188	125	94	127	195	137	936

follows: In cities of 2,500 or less, 82 of the teachers have had normal training only; 382, college or university training only; and 46 had a combined type of training. Reference to the right-hand column indicates that 1,041 were trained in the normal school; 5,059, in college or university, and 936, in normal and college or university.

In order to find out whether or not any striking differences are to be noted in regard to the selection of the different type of teachers in the different classes of cities, the percentages shown in Table XXXVIII have been calculated. This table should be read as follows: In towns of 2,500, 16 per cent of the teachers with any training at all have been trained in normal school only; 74 per cent in college or university only; and 10 per cent were trained in the two combined. It is to be noted that the range of difference is very slight in different-sized cities, for each type of training, which indicates that no particular type of city is given to the selection of a certain type of preparation. The college or univer-

sity is overwhelmingly predominant in the matter of the training of the teachers for high-school positions: 74 per cent of these teachers have had college or university training only; 13 per cent have had normal training only; and 13 per cent have had college and normal training combined, making a total of 87 per cent of these teachers who have come into contact with the college influence, and a total of 26 per cent of the teachers who have come into contact with the normal influence. These figures indicate that the college or university is chiefly responsible for the preparation of teachers for the high school. This certainly suggests that the college and university should take specific recognition of the fact that they are training the large majority of the teachers for the North Central high schools. School men should insist upon it that a part of this preparation should be along the lines calculated to be of specific value to the teacher in the high school.

TABLE XXXVIII  
PERCENTAGE TABLE OF ABOVE

	CLASS OF TOWN							
	A	B	C	D	E	F	G	Total
Normal only.....	16	14	16	12	16	12	10	13
College or university.....	74	72	71	75	70	74	76	74
Combined.....	10	14	13	13	14	14	14	13

The fact that the large majority of these teachers are trained in college is of importance in connection with the criticisms which are not infrequently made by college men. The teachers are largely what the colleges have made them. At least a part of the burden of responsibility for inefficiency on the part of the high-school teachers is chargeable to the college. One way of getting better results in high school will be to give more serious attention to the training of these teachers in college or university. The growing independence of the high school as an institution is surely safeguarded from the point of view of the university from the fact that the people in charge of the high schools are for the most part products of university training.

*Degrees of teachers.*—The North Central Association requires that all teachers be college graduates or the equivalent. Each teacher is required to furnish information as to the exact degree held and the name of the

institution from which the degree was received. Table XXXIX shows the different degrees reported and the total number of degrees held by the teachers in the schools. The variation in the degrees earned by these teachers is interesting. Of the twenty-six different degrees reported, over half of the Bachelor's degrees are in the department of arts. About one-eighth of the teachers hold Bachelor's degrees from the department

TABLE XXXIX

Degrees of Teachers	Under 2,500	2,501 to 5,000	5,001 to 7,500	7,501 to 10,000	10,001 to 15,000	15,001 to 50,000	50,001 and Over	Total
A.B. ....	158	370	364	258	297	433	370	2,450
B.S. ....	37	102	85	56	67	164	101	612
Ph.B. ....	34	76	75	45	51	106	82	469
M.A. ....	14	20	23	12	15	55	77	218
M.S. ....		13	8	3	3	11	6	54
LL.B. ....		1	2		3	1	6	12
B.A. ....	44	48	55	31	31	45	106	360
B.L. ....	5	8	7	3	2	20	23	68
Ph.D. ....		9	4	2	2	5	17	39
Ph.M. ....		2	2	2	1	1	1	9
B.D. ....	2	10	5	3	23	6	7	55
A.M. ....	7	28	30	30	40	52	66	323
Ph.C. ....	1							1
LL.D. ....							2	2
D.S. ....		2			1			3
S.B. ....	3	7	1	6	3	2	1	23
D.D. ....		1						1
M.D. ....		2	2		5	5	3	17
B.Ph. ....	1	2		1	3	2	4	13
M.L. ....		2			1		3	6
B.M. ....		1	1	1		1	1	5
B.P.L. ....			1		1			2
Ag.B. ....	2		2					4
B.C. ....		1			1		3	5
C.E. ....							1	1
M.E. ....		1						1
	308	706	667	453	550	909	879	4,856

of Science; one-ninth hold degrees in law or philosophy; one-eighth of the teachers hold Master's degrees, the large majority of which are in arts. Less than 1 per cent hold the degree of Doctor of Philosophy. The scattering degrees represent different amounts of work; e.g., B.D. represents quite generally only two years of collegiate work.

*Tenure.*—The length of time a teacher serves in a single position is an important item of administration. Table XL shows the distribution

of terms for 6,617 teachers. This table should be read thus: In cities of 2,500 or under, 230 teachers were serving their first year; 117, their

TABLE XL

Total No. Years	Under 2,500	2,501 to 5,000	5,001 to 7,500	7,501 to 10,000	10,001 to 15,000	15,001 to 50,000	50,001 and Over
1.....	238	472	337	236	260	509	297
2.....	117	239	208	154	138	246	135
3.....	42	147	117	98	92	183	120
4.....	27	73	76	47	64	132	76
5.....	21	58	38	33	44	62	49
6.....	12	37	29	26	22	60	59
7.....	7	40	29	21	16	46	50
8.....	5	26	15	13	22	38	32
9.....	3	17	18	9	10	19	40
10.....	4	8	7	14	11	29	57
11.....	4	7	4	7	8	9	25
12.....	1	4	7	6	7	21	24
13.....	1	4	6	4	6	21	22
14.....	1	6	7	3	5	9	18
15.....	.....	9	8	4	4	13	20
16.....	1	1	3	3	4	9	13
17.....	.....	.....	5	3	6	7	8
18.....	2	2	2	5	3	8	9
19.....	.....	3	1	1	2	3	8
20.....	1	1	2	3	4	3	11
21.....	.....	4	1	3	2	2	6
22.....	.....	1	1	2	1	5	5
23.....	.....	.....	.....	1	3	5	5
24.....	.....	.....	.....	3	.....	4	2
25.....	.....	2	2	1	3	7	9
26.....	1	.....	2	.....	1	4	6
27.....	.....	.....	1	.....	.....	.....	3
28.....	1	.....	.....	1	.....	1	1
29.....	.....	4	.....	.....	1	2	8
30.....	.....	.....	1	.....	2	4	4
31.....	.....	2	.....	1	.....	1	3
32.....	.....	.....	.....	.....	.....	.....	3
33.....	.....	.....	1	.....	1	1	.....
34.....	.....	.....	1	.....	.....	.....	.....
35.....	.....	.....	.....	.....	.....	3	2
36.....	.....	.....	1	.....	.....	1	.....
38.....	.....	.....	.....	.....	.....	.....	1
40.....	.....	.....	.....	.....	.....	.....	1
41.....	.....	.....	1	.....	.....	.....	.....
	489	1,167	929	702	742	1,456	1,132

second year, etc. The range of service varied from less than 1 year to 41 years. However, the tenure of a majority of teachers was relatively short. Over one-third of all the teachers were serving their first year.

Certain differences were found in cities of different size. About one-half of the teachers in cities of 2,500 or less were serving in their first year; two-fifths in towns of 2,500 to 5,000; one-third in cities of 5,000 to 7,500; one-fourth in cities of 50,000 or over. The median tenure for cities below 50,000 was one to two years and in cities above 50,000, four years. In consideration of the facts brought out earlier in the study that the large cities pay larger salaries and have more experienced teachers, we should have no reason to be surprised at the longer tenure. The various forces combine in making greater stability of the teaching population. We know little of the real significance of the rapid shift in the teaching population; but surely the cities with an inexperienced, poorly paid, and rapidly shifting teaching population are contending with a serious problem.

#### SUMMARY

One value of such a presentation of facts concerning the administration of high schools is that it affords a simple means of comparison whereby any school may be ranked in reference to the administrative features considered. The numerous distribution tables and medians furnish a basis for ready reference which should enable school authorities to make an intelligent survey of conditions in high schools as to size, organization, and instructional staff. The following tabulated summary of medians should be helpful in this connection.

Table XLI should be read thus: In the 74 cities of class A (in terms of medians) the high-school enrolment is 109, there are 20 students per teacher, there are 23 recitations per day, two of which are taught by the superintendent, whose salary is from \$1,401 to \$1,500. The principal receives from \$801 to \$850. The maximum salary is from \$701 to \$750; the minimum salary is from \$551 to \$600. The teacher in this school has had three years' experience.

*Generalizations.*—There is wide variation from state to state in the number of schools conforming to the standards of the North Central Association; in the size of cities maintaining such schools, in the enrolment of the high schools and in the number of teachers teaching in these schools.

There is wide variation from small to large cities in the number of recitations offered in the school; in the number of recitations taught by



the superintendent; in the number of recitations taught by the teacher; in the length of the recitation period; in the length of the school year; in the size of classes; in the salaries; in the experience; in the tenure; in the sex of teachers and principals; and in the proportion of non-graduates.

TABLE XLI  
TABULATED SUMMARY OF MEDIANS

	CLASS OF TOWNS						
	A	B	C	D	E	F	G
	Under 2,500	2,501 to 5,000	5,001 to 7,500	7,501 to 10,000	10,001 to 15,000	15,001 to 50,000	50,001 and Over
1. No. towns.....	74	162	111	69	67	101	73
2. Median enrolment.....	109	162	175	243	250	450	841
3. Median number students per teacher.....	20	20	20	20	20	20	25
4. Median number recitations	23	29	34	47	49	70	107
5. No. classes taught by super- intendent.....	2	2	1	0	0	0	0
6. Salary of superintendent...	\$1,500*	\$1,600	\$1,800	\$2,000	\$2,000	\$2,500	\$5,000
7. Salary of principal.....	\$ 850*	\$1,000	\$1,100	\$1,300	\$1,400	\$1,800	\$3,000
8. Maximum salary of teachers	\$ 750*	\$ 750	\$ 850	\$ 950	\$1,100	\$1,150	\$1,600
9. Minimum salary of teachers	\$ 600*	\$ 600	\$ 650	\$ 700	\$ 700	\$ 500	\$ 800
10. Years' experience teaching .	3	4	4	4	5	5	8
11. Median tenure.....	1	2	2	2	2	2	4

\* In the \$1,500 group, etc.

Although the median high-school enrolment increases as population increases, it does not increase in the same ratio. Small high schools are found in cities of every class. In the same way it can be said that the number of teachers increases with the enrolment, yet the correlation is not perfect. Eleven- or twelve-teacher schools vary in enrolment from less than 100 to more than 450. The median ratio of 20 students per teacher seems to have become a standard in cities with a population of less than 50,000. The same overlapping is to be noted in the number of recitations taught in each school. Schools offering 21 to 25 recitations per day are found in cities of every class, despite the fact that there is a median increase in the number of recitations as the population increases. The percentage of superintendents who teach decreases from 91 per cent

in the small cities to 13 per cent in the cities with a population of 50,000 or over. The recitation period tends to be longer in the larger cities although the overlapping is such that small cities have long recitations and vice versa. The large cities show a larger proportion of classes with more than 30 pupils. Practically all of the superintendencies are filled by men, although women are represented in cities of almost every class. Women are filling almost one-fifth of the principalships, but the percentage decreases from 43 per cent in the small cities to 3 per cent in the cities of 50,000 or over. Women are filling 69 per cent of the teaching positions, but the percentage decreases from 80 per cent in the small cities to 63 per cent in the cities of 50,000 or over. The salaries for each class of worker increase from small to large cities, the increase being least for minimum salaries and greatest for superintendents. The median experience of teachers increases from 3 years in the small city to 8 years in the city of 50,000 or over. There seems to be no difference in the amount of experience these teachers have had in the elementary schools. About one-fifth of the teachers are not college graduates. The small cities, however, employ relatively few of them. About one-eighth of the teachers receive their training in the normal school alone, and about one-eighth receive their training in normal and college combined. The rest receive such training as they have in college or university. No difference in this particular is noticeable in the towns of different size. One-half of the holders of Bachelor degrees have the degrees in arts. One-eighth of the teachers holding degrees hold the Master's degree. One-third of all of the teachers were serving their first year. The median tenure for cities below 50,000 was one to two years—for cities above 50,000, four years.

The small high schools vary less from the standards of the Association than do the large high schools.

*Suggested conclusions.*—The obvious conclusion from this array of facts is that the standards set up by definition are not carried out in practice. No group of men, no matter how intelligent they may be, can by the pooling of opinions agree upon a list of standards that will serve equally well all high schools. All high schools cannot be made to conform to a list of a priori standards for the reason that there are other determining forces, both within and without the given school. As a rule, conditions found in a given school are a rough portrayal of the educational sentiment of the community. Generally speaking, good schools

are found in good communities. On the other hand, the condition of a given school is not necessarily an index of what the community can do for the school. Because this is true the inspectors in this Association are doing missionary work of a high order when they stimulate lethargic or backward cities to higher standards.

Because of the insistence of the democratic demand that there must be equal educational opportunities for all, small communities are taxing themselves heavily to provide as good schools as are supported by larger communities. These more or less theoretical considerations may account for the fact that small schools are meeting the North Central standards in large numbers.

One of the least valuable and yet most interesting parts of this investigation deals with the distribution of teachers as to sex on three teaching levels, viz., superintendencies, principalships, and teaching positions. The proportionate number of women engaged in education decreases in the direction of the more purely executive positions. The fact that we now find them in large numbers in the high-school principalships and fairly represented in the superintendencies may be prophetic of the future.

From the foregoing data a high-school teacher, principal, or superintendent may easily determine his expectancy as expressed in salary. He can tell whether he receives more or less than the median salary. Of course, there is a fallacy in all such expectancy tables. A particular teacher or principal may be receiving all or more than he is worth and still be in the poorest paid one-third of his class. An insurance actuary, if asked by someone, "What is my expectancy in life?" should reply, "I don't know what *your* expectancy is. It may be two months or forty years. But the expectancy of men of your age is so much." Similarly no individual teacher can determine with any certainty what *his* expectancy is. He can only determine with a fair degree of accuracy what the expectancy is for teachers of his training, experience, habits, and the like. In spite of these limitations, salary tables in cities of a given size do furnish a better basis than none for determining the actual and probable incomes of superintendents or teachers.

The salary tables show that there is a direct correlation between the salary paid and the size of the place, and that the variability and range is greater in large places than in small places. This condition is responsible for much of the shifting of the teaching population from position

to position. The greater money rewards are found in the larger places. Frequently the only way for a teacher to be rewarded, i.e., to get an increase in salary, is to move. It is a misfortune that many communities let the competent go with the incompetent. Communities need to be stimulated to pay good teachers higher salaries so as to insure greater stability of location among teachers. A campaign should be inaugurated for this purpose.

There are no tables in this report of more significance than those showing the experience of teachers. They show that there is little permanency in the teaching corps. With enough vacancies occurring in three or four years to equal the total number of high-school teachers, the school superintendent confronts a constantly recurring problem, that of training the recruits in the methods of schoolroom procedure. This problem is accentuated by the fact that one-half of the high-school recruits are inexperienced, for these data show that the inexperienced teacher stands an even chance of getting his initial experience in a high school. Moreover, there is no good reason to believe that the successful elementary experience of the others is a sure indication of success in the high school. A closer articulation of the two divisions of the schools is not being secured by advancing grade teachers to high-school positions. The task of providing adequately trained people for high-school teaching positions plainly rests with higher educational institutions. Colleges and university schools of education and departments of education are an expression of the desire of the public in regard to this matter. But until the rewards are greater and aroused public consciousness insists upon the employment of only those who are adequately trained, results will be far from satisfactory. One high-school teacher out of every five is not a college graduate. Three high schools out of every four employ one or more undergraduates, in spite of the standards set up by the North Central Association.

This discussion of the results of this investigation may be summarized as follows:

1. Standards determined by definition are not uniformly applied in practice.
2. The problem of administering a system of schools varies in complexity according to the size of the community, the enrolment of the school, the size of the classes, the number of classes, and the character of the teacher.

3. The number of recitations and the potential flexibility of the curriculum and variety of appeals afforded in a given type of schools increase in direct ratio to the size of the community represented.

4. Feminization increases as the amount of executive work decreases.

5. Expectancy as expressed in salaries and tenure increases with the size of the place.

6. Professionalization in teaching rests at present with the more experienced teachers in the larger places.





# THE THIRTEENTH YEARBOOK

OF THE  
NATIONAL SOCIETY FOR THE STUDY  
OF EDUCATION

PART II  
PLANS FOR ORGANIZING SCHOOL SURVEYS  
WITH A SUMMARY OF TYPICAL SCHOOL SURVEYS

BY

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AND

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## TABLE OF CONTENTS

	PAGE
I. PLANS FOR ORGANIZING SCHOOL SURVEYS . . . . .	7
HENRY LESTER SMITH, Superintendent of Schools, Bloomington, Indiana.	
Introduction . . . . .	7
General Principles Governing Surveys . . . . .	7
Brief Outline for Making an Educational Survey . . . . .	26
Elaborate Outline for Making an Educational Survey . . . . .	32
Bibliography of Educational and Community Surveys . . . . .	59
II. SUMMARY OF TYPICAL SCHOOL SURVEYS . . . . .	69
CHARLES H. JUDD, Director of the School of Education, Uni- versity of Chicago.	



# PLANS FOR ORGANIZING SCHOOL SURVEYS

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## INTRODUCTION

In preparing the following paper, I have secured many suggestions from the publications of the National Bureau of Education, from the many excellent annual school reports and school surveys that have been published during the past three or four years, and from several individuals who were kind enough to share a part of their time with me in personal interviews on the subject under discussion. Of the school reports, I wish to mention especially the recent ones from the following cities: Cleveland, Ohio; Elmira, New York; Louisville, Kentucky; Newton, Massachusetts; New York, New York.

The following recently published school surveys are typical of those that have been suggestive in the making of the outlines of things that can profitably be done in school surveys: Baltimore, Maryland; Boise, Idaho; Hamilton, Ohio; Newburgh, New York; New York City—particularly the Interim Report by F. C. Howe and F. J. Goodnow; Portland, Oregon.

For personal suggestions I am indebted to Professors S. C. Parker, J. F. Bobbitt, M. E. Haggerty, and G. D. Strayer. To Professors Strayer and Parker I am especially indebted for valuable criticisms touching the points to be included, their final organization, and the phraseology of certain portions of the paper.

## GENERAL PRINCIPLES

Underlying the preparation of this paper there are three controlling purposes: first, that of reviewing briefly some of the present pressures urging careful study of local school situations; secondly, that of indicating the forces that can most safely and profitably be intrusted with making local surveys of school conditions, and finally, that of suggesting a possible method of approach to the problem of making an educational survey in cities of from five to fifty thousand inhabitants.

Education is no longer the simple process that it once was. From haphazard imitation a progressive step was made long ago toward conscious effort to teach in a systematic way. Ultimately this tendency crystallized among the favored classes into the practice of having a single individual teach a single child one subject at a time. From the demand that a single child be taught a single subject by a single individual we have progressed to the point where children in large groups must be taught, not simply a single subject, but the three R's, and not simply the three R's, but many additional subjects also. Modern education, too, is no longer limited to the intellectual field, but extends into the physical and the moral as well. Besides all this, the present-day school system is called upon to educate, not simply the children of from six to fourteen years of age, as formerly, but kindergarten children, youths, and adults, also. Moreover, these kindergarten children, youths, and adults are to be trained, not simply that they may make a better living for themselves and that they may also serve in the maintenance of the best that has been experienced thus far by the race, but, further, that they may make actual contributions to the knowledge that the race already possesses. With this increase in the scope of the things to be taught, in the variety of individuals to be taught, and in the purposes behind the teaching, the element of complexity has developed to such an extent that thorough organization has become essential. Devices are needed to aid the mind in grasping the situation, and in focusing the attention of educators on individual parts of the school system while they at the same time carry in mind the idea of the whole.

So rapidly has this complexity been forced upon us that we sometimes feel lost in the maze of it and realize the inadequacy of the organization that has been thus far developed to meet it. The need of a careful examination of our product to see whether it meets expectations or not continually forces itself upon our attention. A further problem is at present formulating itself, and that is the desirability of an examination to determine whether we are teaching the things actually needed by pupils in the public schools.

In order to aid in the intelligent solution of these two problems the survey has recently been called into service—the educational survey to reveal just what we are doing with the children we are working upon and just what the conditions are under which we are working, and a more general survey including social, mercantile, and industrial surveys, to

determine whether we are giving an education that the local situations justify.

In order to determine with reasonable accuracy just the things that are essential in the education of the people of any community, a social survey is necessary. The more complete such a survey is, the better it furnishes a setting or a background upon which to make the educational survey.

Without such a survey unintelligent conclusions might readily be drawn from the educational survey of actual conditions in the schools of the community. For this reason it is desirable, if possible, to make a preliminary but comprehensive social survey comparable to those made in Pittsburgh, Pennsylvania, Springfield, Illinois, and Syracuse and Newburgh, New York, including a study of health conservation and sanitation, housing conditions, betterment agencies of the city, foreign population, juvenile and adult delinquency, civic improvement, labor conditions, municipal accounting, public finance, local taxation, vital statistics, playground equipment and needs, occupations for youths and adults. Ultimately such a detailed survey will be necessary in order to provide adequately for the various interests of the total social group. Our democratic ideals drive us finally to such a survey. But where such an elaborate collection of data cannot be adequately made and interpreted it is well to begin with a less extensive plan. A survey much less pretentious could profitably be made which would aid greatly in interpreting the adequacy of educational facilities.

The following extract from Carol Aronovinci's *Knowing One's Own Community* is suggestive in connection with the scope and the starting of a general survey.

#### STARTING A SURVEY

A survey, like any other civic activity involving a conscious effort on the part of a group of citizens, must be started by some particular civic or philanthropic agency, some body of men or women interested in the welfare of the people whose intentions cannot be questioned and whose integrity, good judgment, moral and political standing are beyond reproach. Most small cities and towns have a Charity Organization Society, a Young Men's Christian Association, a Board of Trade, a Business Men's Association, a Grange, a large Women's Club, a University Club, or some other similar organization or agency which is backed by prominent men or women or both. The person or persons interested in making a survey should select the most prominent, the most



respected, and if possible the best financed organization in the community to back the work. The main conditions to be observed in selecting the organization should be as far as possible a complete absence of sectarian affiliations, political color, or special industrial or public-service interests.

When the organization has been decided upon, a carefully selected special committee of persons from various walks of life should be appointed with instructions to plan and organize the survey under the auspices of that organization. This committee should not be so large as to be unwieldy, nor so small as to be in danger of being one-sided or not representative of the best elements in the organization. A committee of ten persons in localities under ten thousand population and of fifteen to twenty in localities over ten thousand with special subcommittees would probably prove most efficient.

#### SCOPE OF SURVEY

A survey should cover as far as possible every phase of community life, advantageous and disadvantageous, that time and available energy can secure, but if selection of specific problems is made either for the purpose of beginning the work or because of limitations of time and working force, the lines of investigation selected should be practical, should have in view improvements affecting as many people as possible, should be easily understood by the masses, and should be measurable in commonly accepted quantities. If the supply of milk is bad an investigation into the sources of milk and the passage of proper regulations for the control of the milk supply will soon show results that can be measured in terms of a material reduction in the infant mortality and morbidity. If the schools are spending large amounts of money with meager results, an investigation into the accounting system of the school department, a study of the physical conditions of the children, and visits to the homes of backward and truant pupils will soon reveal the cause of the inefficiency in terms which can be easily understood and almost as easily remedied.

Stated in brief, a survey must follow lines which are of a practical character and must have in view tangible improvements which are easily understood and most generally desired.

#### OUTLINES FOR SOCIAL SURVEY

A fairly adequate social survey is illustrated by that being made at present by the high-school and departmental grade teachers of Bloomington, Indiana. The following outlines for gathering the data desired have just been agreed upon by the committee appointed by the high-school teachers for drawing up a plan.

## MERCANTILE SURVEY OF BLOOMINGTON

## STATUS OF FIRM

1. Firm name.....
2. Location.....
3. Mercantile pursuit.....
4. Commodities:
  - a) Main line.....
  - b) Side line.....
5. Character of firm (*partnership, corporation, co-operative, profit-sharing*).....
6. Amount of capital.....
7. Number of stockholders.....
8. Are stockholders resident or non-resident?.....

## STATUS OF EMPLOYEES

1. Welfare activities in behalf of employees.....
2. To what extent are employees stockholders?..... Profit-sharers?.....
3. Special privileges extended to employees.....
4. Are vacations granted on the firm's time?.....
5. Promotions:
  - a) What factors determine?.....
  - b) How frequent?.....
  - c) Grades—e.g., are managers and departmental heads chosen from lower grades?.....
6. Desirable age for beginners.....

## FIRM'S ATTITUDE TOWARD SCHOOL TRAINING OF EMPLOYEES

1. How may the public schools prepare employees more efficiently?.....



Birthplace of mother . . . . .  
 Male children, ages . . . . .  
 Female children, ages . . . . .  
 Number of cases of illness during past year . . . . . Parents . . . . . Children . . . . .  
 Character of illness . . . . . Length of illness . . . . .  
 Length of residence of family in Bloomington . . . . .  
 Number of different school corporations family has lived in . . . . .  
 Grade in which father left school . . . . .  
 Grade in which mother left school . . . . .  
 Male children who have left school, left in what grades? . . . . .  
     Reason for leaving . . . . .  
 Female children who have left school, left in what grades? . . . . .  
     Reason for leaving . . . . .

## HOUSING:

\**Kind of house* . . . . .  
*Condition, inside* . . . . . *Outside* . . . . .  
 Number of families in building . . . . .  
 Number of rooms . . . . . Size . . . . .  
 Number of sleeping-rooms . . . . .  
*Window provision ample?* . . . . .  
 Number of dark rooms . . . . .  
 Cellar . . . . . Sewer connections . . . . . Cesspool . . . . . Plumbing . . . . .  
 Water supply, well . . . . . Cistern . . . . . City service . . . . .  
 Toilet, inside . . . . . Outside . . . . .  
 Lighting . . . . . Method of garbage disposal . . . . .  
*Front yard* . . . . . *Back yard* . . . . .  
 Cooking done at home . . . . .  
 Heating: Stove . . . . . Furnace . . . . . Hot water . . . . . Steam . . . . .  
*Furniture, quality of* . . . . . *Ample* . . . . .  
 House owned . . . . . How purchased? . . . . .  
 Mortgage . . . . . Lodgers or boarders . . . . .  
 Bathing facilities . . . . .  
*General cleanliness and order* . . . . .  
*General condition of streets and alleys adjoining property* . . . . .

## INCOME:

Earnings of father, weekly . . . . . monthly . . . . . yearly . . . . .  
 Earnings of mother, weekly . . . . . monthly . . . . . yearly . . . . .  
 Earnings of children separately . . . . .  
 Income from other sources . . . . . Total income . . . . .

## SAVINGS:

Bank deposits . . . . . Trust company deposits . . . . .  
 Building and Loan Associations . . . . . Postal . . . . .  
 Life insurance . . . . .  
 Property insurance . . . . . Chattel loans . . . . . Rate . . . . .  
 Purchase on instalment . . . . .

\* The italicized questions are not to be asked, but are to be filled out by surveyor.

EXPENSES:

Rent.....Clothing.....Food.....Fuel.....Lighting.....  
 Recreation and amusement.....Travel.....Taxes.....  
 Dues and contributions.....Other items.....  
 City water.....

INDUSTRIAL STATUS:

Occupation of father, hours.....Day or night labor.....  
 Occupation of mother, hours.....Day or night labor.....  
 Occupation of children that work, hours.....Day or night labor.....  
 Occupation of relatives living with family, hours.....Day or night labor.....

SOCIAL CHARACTERISTICS:

Church membership, father.....Mother.....  
 Church attendance, father.....Mother.....  
 Sabbath-school attendance, father.....Mother.....Children.....  
 Number of children in public schools.....  
 Club membership, father.....Mother.....  
 Fraternal orders, father.....Mother.....  
 Labor organizations, father.....  
 Means of recreation, father.....Mother.....Children.....  
 Charity received.....  
 Character of reading.....  
 Interest in music.....  
*General moral status*.....  
*Does father drink?*.....*Gamble?*.....  
 Date.....*Surveyor*

INDUSTRIAL SURVEY OF BLOOMINGTON

1. Firm name.....
2. Distribution of laborers as regards kind of employment.  
 a) Laborers.....  
 b) Skilled workmen.....
3. Source of labor supply.....
4. How may the public schools prepare employees more efficiently?.....
5. How have the schools hitherto successfully or unsuccessfully contributed to such preparation?.....
6. What changes in courses or methods would you suggest for more practical training?.....
7. Will the employment permit employees to attend part-time day-school?.....
8. Will evening schools be feasible for mature employees?.....
9. What special aptitudes and qualities (physical strength, dexterity, mental alertness, etc.) are considered most valuable in each line of employment?.....
- Information supplied by.....
- Interview conducted by.....Date.....



	Type of Skilled Labor	Number	Hours	Salary Maximum	Salary Minimum	Length of Time It Takes to Become Pro- ficient in	Overtime Require- ments	No. Days Work per Week	Work of a Seasonal Character	Causes for Seasonal Employment	Occupational Risks
1.											
2.											
3.											
4.											
5.											
6.											
7.											
8.											
9.											
10.											
11.											
12.											

The gathering of the above data is done by the teachers themselves. The tabulation of the data will be done largely by clerical help. The final interpretation of the data will be made by the teachers, principals, and superintendent.

The educational survey proper should be made along lines in which standards of measurement have already been fairly well worked out, standards applicable to the construction, equipment, and maintenance of the school plant, to the qualifications, selection, and tenure of office of superintendents, principals, teachers, janitors, and other employees, to the course of study, to enrolling and holding individual pupils, and finally to measuring the quality of the performance of pupils in their school subjects.

In connection with some of these points, such as the construction and equipment of buildings, standards have been fairly well worked out for some time. These are adequately set forth in *American School*

*Houses* by Professor Fletcher B. Dresslar. Dr. Franklin Bobbitt, of the University of Chicago, is gathering some data that will ultimately be helpful along this line. The mimeographed blanks that he is using in gathering these data he will gladly furnish free of charge to superintendents within the North Central territory. Subjective standards have been used for a long time in measuring the quality of teaching done, but only recently have serious attempts been made to measure the quality of teaching by an objective measurement of the knowledge possessed by the subjects of the teaching. Among the most efficient and recent of the objective measures are:

1. Scales for measuring the quality of handwriting: one by Dr. Edward L. Thorndike and one by Dr. Leonard P. Ayres.
2. A scale for the measurement of quality in English composition by Dr. Milo B. Hillegas.
3. Spelling ability—its measurement and distribution—by Dr. B. R. Buckingham.
4. Arithmetical abilities, by Dr. C. W. Stone.
5. A series of tests by Dr. S. A. Courtis on arithmetic, reading, composition, punctuation, spelling, syntax, memory, and handwriting.
6. The measurement of achievement in drawing, by Dr. Edward L. Thorndike.

In the *Twelfth Yearbook* of the National Society for the Study of Education, Part I, "The Supervision of City Schools," Dr. Franklin Bobbitt presents a good discussion of the use of such tests for exact measurement purposes.

The Thorndike scale for measuring the quality of handwriting can be obtained from the Bureau of Publications, Teachers College, 120th Street and Broadway, New York City. The separate scales cost five cents each.

The Ayres scale for measuring the quality of handwriting can be obtained from the Division of Education, Russell Sage Foundation, 130 East Twenty-second Street, New York City. Price of scales, five cents each.

The Hillegas, Buckingham, and Stone tests are all published by the Bureau of Publications, Teachers College, New York City. The price of the Hillegas scales is two cents a copy; the Buckingham scale costs \$1.25 in cloth and \$0.95 in paper; the Stone tests are \$1.00.

The Courtis tests may be secured by writing Courtis Standard Tests, 82 Eliot Street, Detroit, Michigan.

Tests complete in sets ready for use:

Series A, Arithmetic, per thousand . . . . .	\$20.00
Series B, Arithmetic, per thousand . . . . .	18.00
Series C, English, per thousand . . . . .	20.00
Test 7, Series A, Loose sheets including necessary instructions and record sheets, per thousand . . . . .	10.00
Folders of instructions, each . . . . .	.05

With all of these helps supplemented as they will be very shortly by standards in many additional fields worked out under the supervision of Dr. Thorndike, it will be possible to measure the efficiency of any system of schools with a measure more tangible and less variable than that of personal opinion.

The following extracts from the report of the Committee on Standards and Tests for Judging the Efficiency of Schools and Systems of Schools, presented by Dr. George Drayton Strayer, is suggestive of the range of school conditions that lend themselves fairly adequately to objective measurement:

What methods are to be employed in an efficient school survey? A school survey will naturally aim to deal with those phases of school organization which are capable of exact objective review. Thus the financial management of the schools should be taken up. The physical equipment of the schools should be examined. The attendance at schools, including the question of enforcement of the compulsory attendance law, can be definitely determined. The rate of promotion within the grade can be definitely known. The number of children in a given classroom should be ascertained; the provisions that are made for exceptional children, including defectives; the method of training teachers, their qualifications, the method of their appointment, and the method of eliminating inefficient teachers should be considered. The salaries of teachers and the rules governing their tenure of office; the provisions that are made for the improvement of teachers during the period of their services; the organization and functions of the supervisory staff and the efficiency with which they carry out their work, especially with reference to their conduct with the classroom exercises; the efficiency of instruction, including an examination of the courses of studies; the methods of class instruction, including the variations in these methods of class instruction, the variations of these methods which are to be observed in the different parts of the system, and the measurement of the achievements of pupils in the subjects commonly taught:

all will be subject to careful review. There should also be made an examination of the provisions which exist within the system for recording such data as are necessary for the proper study of educational problems, together with recommendations concerning the use to be made of these facts.

Any school inquiry should, so far as is practicable, observe, measure, and report the conditions of the community's political, industrial, social, and educational life which favor or interfere with the work of the schools. Investigators should dwell upon the achievements of the school system, especially noting the direction in which it is moving. The measure of the efficiency of any school or system of schools must always be made in terms of the changes, developments, improvements, or growths in efficiency which have taken place under a given administration or during a given period of years.

After determining that an educational survey is essential to progress the question arises, "How can and should the survey be made and by whom should it be made?" There are school officials who feel that they themselves can take adequate care of their own school affairs and who consequently fail to welcome what they term interference from the outside in an attempt to point them to the light. There are those, too, on the outside who feel that practical school men are not among the elect as far as knowledge of what they should do and are doing is concerned, and can therefore be trusted with the job of overhauling themselves only at great risk and danger. There is, on the one hand, the attitude of self-satisfaction that begets a lazy, unintelligent conservatism that needs to be jostled out of its routine ruts, and such an attitude naturally brooks no foreign interference. On the other hand, there is the attitude of the outsider who sometimes feels that his genius alone is sufficient to delve to the bottom of existing difficulties and not even the aid of a native in holding a candle while he works is tolerated.

There is some foundation for the feeling that reform from within is initiated with difficulty. Those within a system are naturally controlled by traditions, and consequently travel the blazed trail without seeking new paths. Even philosophers tell us that schools of philosophy develop and tend to build a crust around their theories, so that new ideas can with difficulty penetrate current thought. Concentration on the old ways of doing things tends to enhance ignorance and to blind individuals to their own faults.

Aside from ignorance and the hampers of tradition, there is another reason, plausible on the surface, why a school system should be reformed



from without, namely, the tendency of human nature to defend past action and thus to furnish protection against adverse criticism. This argument is based on the assumption, however, that people are ultimately dishonest, a supposition that can scarcely be maintained, I think. Even if the supposition were correct, it would argue, in the long run, in favor of local authorities having a part in the survey in order to make it easier for them to discover, acknowledge, and correct the faults in the system.

Any school system needs expert direction and suggestions in connection with its surveys in order to avoid the pitfalls suggested above, but this concession does not carry with it the conclusion that the survey should be made wholly independently of the aid that the system itself can give.

The conventional habit of teachers of looking to superintendents and supervisors for all reforms has limited the possibility of teachers doing constructive work themselves; and the assumption of a similar attitude by school officials to the effect that they must have outsiders do all constructive work for them will tend to conceal from them and from society their own possibilities in the line of constructive work. In principle, then, the attitude of experts in feeling that school administrators cannot examine adequately their own work, even under direction, is vicious in character and harbors a tendency that the spirit of democracy has been vigorously attempting to shake off for centuries past. Just as any set of experts would rightly resent the assumption that an outside interest could properly diagnose their work without their help, so the school officials in any community, however benighted through ignorance and shackled by tradition, can justly assume that their suggestions and help would be valuable to outsiders in discovering points of strength and weakness. It is not the contention that every community is able of itself to initiate or even to carry out a reform movement, but rather that each community possesses the latent ability to be of invaluable service in such a reform under proper, unprejudiced guidance from without. It would doubtless be necessary to impart some leaven from the outside to stir up latent possibilities, but once these possibilities should be stirred up, set in motion, and directed, they should be able of their own momentum in a vast majority of cases to continue to pour out valuable results. If a locality is blind to its faults, that blindness cannot be cured by someone's saying: Behold! and then pointing out what there is to be seen. A more fundamental cure is necessary, and that cure is to lead the



benighted to the light of experience. The light of experience can come only with actual participation in the work.

To the argument for actual participation in the work by local school officials and the teaching corps itself there seems to be only one valid objection and that is the objection that such a survey stretches over too long a period of time. It is true that such a survey is a slower process than a survey made by outside experts, because the outside experts can devote all of their time to the one thing. Wherever it is essential that the survey be completed in a limited period of time the work should not be crowded on to the local teaching corps. Generally, however, the demand is not so insistent as to necessitate depriving local forces of the privilege of doing a large part of the actual survey work.

Assuming then that an adequate survey can be made by the school system itself under expert advice and guidance—and this assumption is certainly as sound as the opposite assumption until it is proved by trial to fail—we should examine in what way the results would be more desirable from such a survey than from one made wholly by those on the outside.

In the first place, defects are bound to be discovered by any adequate survey in even the best system of schools, and if these defects are to be remedied there must be a readjustment of the school officials to the new light unless the officials be simply ousted and new people be put in their places. Experience shows that the damage from the latter procedure is sometimes as bad as the original condition with its blindness to faults. Experience shows further that it is easier to adjust one's self to self-criticism than to criticism imposed from without. And the ease of making the new adjustment is an essential consideration in any procedure that is not merely destructive but constructive as well.

In the second place, the educative effect upon local authorities who make a survey themselves is of significant importance. Knowledge to the saturation point can come only by actual participation in the work. The mere review of results and conclusions slides off in a way that is readily understood by the teacher as opposed to the teller. With the full comprehension of the meaning of the survey—a comprehension that can come only through actual participation—comes not only a new consecration of service to the general problems of the profession and a more genuine willingness and inspiration to follow results revealed by the particular survey, but a more genuine knowledge of how to grapple with the perplexities that must continually confront school officials.

Not only are people more willing to correct and more capable of correcting errors that they themselves have had a hand in locating, but by so doing they disarm any tendency of local enemies to cast irreparable reflection upon the system or to make political capital out of the findings. The very fact that those within the system have discovered their own weaknesses is an argument that somehow or other they themselves will be able to eradicate these weaknesses. Hence the danger of an unwarranted clamor for a change in administration is reduced to a minimum.

Everyday observations and practices support the contention that errors should be discovered and cured largely from the inside. Forced reform and forcing attention to the need of reform are two very different things. The reform must take place within the individual, and the individual must himself feel the need for it through self-discovery, though the start toward that discovery be stimulated from the outside. An outside influence can only direct internal effort to a change. It cannot work the reform. And I take it that we do not want to lodge in our activity in school surveys on the level where we so long tarried in medical inspection—the plane of pointing out conditions without concern as to their ultimate remedy. Our democratic theory of freedom should operate at least to the extent of giving school systems an opportunity under capable guidance to diagnose their own cases and to work the consequent cure before demanding meek submission to the invasion of the foreigner and the putting on of the foreigner's habit in the solution of the difficulty.

A final though a minor argument for surveys by the local authorities is that of decreased cost. In the case of a local survey the workers and the machinery are both on the field, so the cost of transportation is eliminated. Salaries too are largely already supplied in the case of local investigation, whereas these are an added burden when surveyors from abroad are imported.

The self-survey under competent outside expert direction gradually forces itself upon one as opposed to the survey by outside experts because of the smaller financial cost, because of the avoidance of internal community eruptions stimulated by radical conclusions deduced from statistics unsympathetically gathered and interpreted, because, further, of the wholesome educational and stimulating effect of such a self-examination upon the whole teaching and supervisory corps of a school

system, and because, finally, such a work is the logical job of those already employed to determine and carry out the policies of the school system.

The following extract from the report of Professor G. D. Strayer, chairman of the Committee on Standards and Tests for Judging the Efficiency of Schools and Systems of Schools, presents briefly the opinion of this committee on this subject:

A survey can be most advantageously undertaken by the school officers. If the citizens wish to have a survey made they ought to be able to secure it through their regular representatives on the board. Groups of citizens who cannot secure such action through the board should be provided with means of carrying out a survey, and should feel justified in adding temporarily to the supervisory staff a group of specialists competent to undertake a thorough-going inquiry. Furthermore, the superintendent ought to be in position at any time to call in impartial professional advisors in case he finds school interests seriously jeopardized. Whether the survey originates with the superintendent, or with the board, or with an interested group of citizens, its purpose should be to protect and advance the interests of the children and youth of the community by employing specialists, either within or without the system, competent to study scientifically the school system, and able, by virtue of their experience as educators, to propose adequate and workable reforms.

The following extracts from letters written in reply to an inquiry for statements of attitude toward the co-operative plan of conducting school surveys makes clear the advisability of enlisting the services both of university experts and of local school people in school surveys:

W. C. BAGLEY, Director, School of Education, University of Illinois, Urbana, Ill.: I may say that we are very desirous in our department of co-operating in every helpful way with those who are conducting school surveys in our state. The Illinois State Teachers' Association, at its meeting in December, adopted a resolution favoring a state school survey to be made by the State Department of Public Instruction in co-operation with the School of Education at the University, the normal schools, and other educational institutions of the state. Pursuant to the spirit of the resolution a survey has been planned and the preliminary steps are now well under way. Professor Coffman is director of the survey and Professor Johnson, Professor Bobbitt of the University of Chicago, and myself are co-operating in the investigation of certain specific topics.

There are, of course, certain dangers that are involved in placing the leadership of these surveys in the hands of the educational departments of the

universities. I should say, however, that these dangers are quite overbalanced by the advantages which this policy involves.

PROFESSOR J. F. BOBBITT, School of Education, University of Chicago: The superintendent of a neighboring city recently proposed a survey for his school system, to be conducted by men from the University. While the response of teachers and principals was on the whole favorable, yet there were a few who asked, "Why should not you, the superintendent, make all necessary analyses of school conditions, point out merits and shortcomings, and make all the desirable recommendations? Why call in men from the University?"

Undoubtedly, as the questions imply, it is the superintendent's chief function to do just these very things, currently and continuously, for his school system. And yet there is, at the same time, full justification for an occasional analysis of school conditions by someone who is not a permanent member of the system, however good may be the work of the schools. While the members of the school organization have a far more intimate acquaintance with the details of the school work than any co-operating or temporarily employed outsider can possibly have, yet this very familiarity with the details of the work, filling as it does so large a portion of the field of vision, tends naturally and inevitably to shut out a sufficient view of the more general relations. A thing is to be seen in wide perspective only by one who can stand some distance away from it and view it as a whole, disinterestedly and objectively. One's vision must not be distorted by personal interests, personal acquaintances, and the forms of bias and prejudice that spring from these. However superior, therefore, may be the teaching and supervising staff of a city-school system, it seems desirable for a city to have periodically some disinterested outsider examine into the factors composing the educational situation.

It is in fact a necessary division of labor. The teachers and supervisors of the city are specialists in the details of that particular situation. The co-operating university workers are specialists in the more general relationships of educational movements. It is the business of the university men to see these movements as they exist throughout the country; it is the business of superintendent and teachers in a given city to see these movements in their concrete details as they exist in their particular city. Efficiency in both kinds of work is not easily possible under present conditions.

This specializing of functions and co-operating of the specialists is especially desirable during our present transitional age when our school systems are being thoroughly overhauled and reconstructed. The changes demanded require thought, study, and arduous, long-extended labors on the part of teachers and supervisors. Completely engrossed in the task of making the particular adjustments needed at the time, it is difficult to keep in mind the total movement of which the immediate tasks are but parts. They cannot well be sure as to the



next steps to be taken in any given case. They have distinct need of the specialist in the wider relations.

LOTUS D. COFFMAN, University of Illinois, Urbana, Illinois: In a number of states the movement to survey the public schools was initiated by people not officially connected with the schools. But in Illinois the survey now being organized was begun by the school people themselves. That this state might not prove a laggard in educational advancement, a number of men and women, representing every type of public education in the state, met in Springfield in response to a resolution passed by the last State Teachers' Association, calling for a state-wide educational survey, and appointed an executive committee consisting of President David Felmley of Normal, chairman; Superintendent Hugh S. Magill, Jr., Springfield; County Superintendent Charles McIntosh, Monticello; and Principal Morgan C. Hoggs, Chicago. Dr. Lotus D. Coffman of the University of Illinois was made an *ex-officio* member of the Executive Committee and director of the survey.

Faith in the possibilities of this survey is founded upon the number of agencies that have expressed a willingness to co-operate in carrying it forward. State Superintendent Francis G. Blair has authorized the committees to collect as much of the information as possible through his office and has offered the assistance of his statistical experts in collating the material. Assistance will be received from the State Teachers' Association and its large sectional organizations, the Principals' Club, the University of Chicago, Northwestern University, the normal schools of the state, and the University of Illinois.

HON. P. P. CLAXTON, United States Commissioner of Education, Washington, D.C.: I think your suggestion that universities should co-operate with school officials in making school surveys is a good one. Neither the university man nor the school man alone is capable of making the best survey. Both working together ought to make the survey much more valuable. It would be still more valuable if the university man and the public-school man and the business man could co-operate. The points of view of these are needed in making any adequate survey of a school system.

ELLWOOD P. CUBBERLEY, Leland Stanford Junior University, Stanford University, California: If school surveys are made in an appreciative spirit they can be made a very great help to city-school systems. Such surveys can best be made by those who have carefully studied the educational problem and who can approach the work of a survey with the idea of finding out the excellences of the system as well as its defects. I think we are not likely to have too many good surveys; but of investigations, as contrasted with surveys, we need very few. A good survey is in the nature of a taking of stock with a view to further purchase and development, and a school survey ought to offer a good constructive program for the community surveyed.



EDWARD C. ELLIOTT, University of Wisconsin, Madison, Wisconsin: I believe most heartily in the form of co-operation referred to in your letter of April 2 relative to school surveys. I believe the survey affords the most practical instrumentality for the accomplishment of what has always seemed to me to be the fundamental purpose of all such supervision. This purpose may be very simply summed up thus:

*To discover the truth about our institutions of education in such form and in such manner as will make our profession of citizenship more intelligent as to the motive, methods, and machinery of the whole school plan and to cause our profession of education to be more directly purposeful and more consciously constructive.*

If I were to analyze the above general purpose I would call attention to the following special items which seem to me to warrant attention on the part both of university students of education and of those engaged in actual practice in schools: (1) There is too wide a gap between our theories of education and our practices in schools. (2) There is too much pretense of teaching and school supervision, and, consequently, too little economical performance of fundamental educational worth. (3) We have had too few facts on which to ground whole truths about the productivity and economy of the public-school system. (4) We lack that kind of publicity necessary for the intelligent confidence of our people in their schools. (5) Our school systems move forward by drifting through the channels of least resistance or of greatest attractiveness, rather than by an intentional direction through the intricate passages that lead to the greatest ultimate utility.

W. A. JESSUP, University of Iowa, Iowa City, Iowa: Educational interests are to be congratulated on account of the present tendency to conduct school surveys by means of the co-operation between university experts and local school officials. Each institution has much to gain from this type of co-ordination. The school survey needs the expert ability, the scientific attitude, and the vision of the professor of school administration. The university, on the other hand, needs to come into contact with the real problems to be found in the development of an educational system.

G. D. STRAYER, Teachers College, Columbia University, New York: It is my belief that the specialist should be called in by the local administration for the purpose of giving advice when a school survey is to be made, for exactly the same reasons that specialists in other lines of study and investigation are used in their fields of inquiry. We are all familiar with the rôle played by the specialists in taxation, or in engineering, or in preventive medicine, and the like, in practical affairs. I am inclined to think that the combination of the practical administrative officer and of the student and investigator will always mean a higher degree of efficiency in the survey of a school system than can be expected if either works alone.

HARLAN UPDEGRAFF, University of Pennsylvania, Philadelphia, Pennsylvania: In my judgment, boards of education or superintendents, or both in unison, are warranted in calling upon educational experts in universities to express their opinions regarding the advisability of possible courses of action or the continuance of a policy that has been on trial. Such an expression may also serve a useful function in making known to a school board and citizens the status of their school system as compared with systems elsewhere, such knowledge to be used as a basis for determining further policies.

Professors of education in universities have peculiar advantages for such service in that they are well informed as to the latest developments in their respective fields and also in that they have opportunity to examine impartially the success of various plans in the schools that are visited by them. Particular care should be taken by such persons called upon to render this service that they gain a full and correct knowledge of the peculiarities of the local situation in which the inquiry is made. This is not always possible in the brief time that is sometimes allowed for these inquiries and herein lies a limitation to the usefulness of their service.

Two outlines follow, one a brief outline intended to be suggestive of some of the more important things that might be considered in a limited study of local educational conditions; the other a more elaborate outline given in the spirit of suggesting a range of subjects that might profitably be investigated in an educational survey of a small city system of schools. In no one system would it be desirable to attempt in any survey an investigation of all or of even a large part of the points suggested in the longer outline.

## A BRIEF OUTLINE FOR AN EDUCATIONAL SURVEY

### SCHOOL PLANT AND EQUIPMENT

#### I. General Facts about Each Building.

1. Description of location.
2. Floor plans.
3. Dimensions, original cost, date of erection, and present condition.
4. Material used in construction.
5. Protection from fire.
6. Heating and ventilating systems, description of.
7. Number, purpose, and size of various rooms in building.
8. Number of teachers and pupils accommodated.
9. Adequacy of steps and stairways for age and number of pupils accommodated.
10. Drinking and washing facilities.
11. Toilet accommodations.

## II. Specific Facts about Each Room.

1. Use made of room.
2. Number and grade of pupils accommodated.
3. Seating.
4. Dimensions and size showing:
  - a) Cubic feet of air space per child.
  - b) Square feet floor space per child.
5. Blackboards.
  - a) Amount of available space.
  - b) Condition of.
6. Lighting.
  - a) Light space area compared with floor space area.
  - b) Height of top of windows compared with width of room.
  - c) Freedom from shadows cast on children's work.

## III. Equipment of Building as a Whole.

1. Number, kind, and value of library books.
2. Same for musical instruments and equipment.
3. Same for other equipment like stereopticon, lantern slides, etc.
4. Same for sets of supplementary readers.
5. Same for equipment, such as wall maps and globes.

## ORGANIZATION, ADMINISTRATION, AND SUPERVISION

## I. General Organization.

1. School Board.
  - a) Number, term, and method of selection of members.
  - b) Qualifications required for membership.
  - c) Qualifications of present board and of boards for a period of years past.
  - d) Meetings.
    - (1) Time and place.
    - (2) Regularity of attendance.
    - (3) Contents, preparation, and preservation of minutes.
    - (4) Powers and duties.
      - (a) Exercised by board.
      - (b) Delegated by board.
2. Superintendent.
  - a) Qualifications required and term of office.
  - b) Qualifications actually possessed by superintendents for a period of years back.
  - c) Powers and duties.
  - d) List of things actually done in a period of time of from one to four weeks showing range of duties and relative amount of time devoted to each.

- e) Assistance given superintendent—
  - (1) By clerks.
  - (2) By assistant superintendent, or
  - (3) By principals being given time off from actual teaching.

3. Principals.

- a) Qualifications required.
  - b) Qualifications possessed by present corps.
  - c) Duties required of principals.
  - d) List of such duties performed in a definite period of from one to four weeks in length.
  - e) Time free from recitation duties.
  - f) Assistance given by clerk.
4. Co-ordination of authority vested in school board, superintendent, principals.

II. Business Administration.

- 1. Methods of bookkeeping.
- 2. Filing system.
- 3. Methods of purchasing, distributing, and keeping track of supplies.
- 4. Samples of important reports and records regarding attendance and progress of pupils.

III. Educational Administration.

- 1. Teaching corps.
  - a) Qualifications required.
  - b) Qualifications actually possessed by present corps.
  - c) Permanency of.
  - d) System of improving qualifications of teachers already in the service.
- 2. Supervision of actual schoolroom teaching.
  - a) Statement of various things done within a limited period of time in an attempt to improve the classroom work of some specific teacher.
    - (1) Things done by superintendent.
    - (2) Things done by principals.
    - (3) Things done by special supervisor.
- 3. Supervision of course of study.
  - a) In making course of study, to what extent are services enlisted of—
    - (1) School board?
    - (2) Superintendent?
    - (3) Principals?
    - (4) Teachers?
  - b) Illustrate by use of a specific subject the method by which co-operation is secured.

## COURSE OF STUDY

1. Different Subjects Included in the Course.
  1. Very brief outline of the course in each subject.
  2. Amount of time allowed to each subject per week in each grade.
    - a) For preparation on part of pupil.
    - b) For recitation.
  3. Time required for average child to complete each portion of the course.
    - a) In primary grades by years only.
    - b) In department and high school by years and subjects.
  4. Percentage of total failures that each year and each subject takes as its share of the failure toll.
  5. Number of pupils and percentage of total enrolment in the grade taking each subject where an option is given.
  6. Organization of course to meet varying individual and classroom abilities.
  7. Titles and cost to pupils of public schools of textbooks in use.

## THE CHILD

- I. School Census.
  1. Frequency and method of taking.
  2. Census statistics.
    - a) Enumeration for a series of years past by years, age, sex, nationality—showing percentage of increase or decrease in each.
- II. Enrolment Statistics for Purpose of Showing Efficiency of System in Getting Pupils into School.
  1. Enrolment for series of years past by age, grade, nationality, sex, time of year, occupation of parents.
  2. Average age of beginning pupils—ages taken September 1 and February 1.
  3. Number, age, and percentage by grades of pupils entering the system each year from outside systems of schools.
  4. Number, age, and percentage by grades of pupils who have had all of their education in the local system.
  5. Ratio of number of children in school over compulsory age to number within compulsory age. Degree to which this ratio is increasing or decreasing.
  6. Machinery for getting children into school.
    - a) State law provisions.
    - b) Local initiative.
    - c) Promptness of reporting and disposing of cases.
    - d) Percentage of cases that have to be dealt with once, twice, three times, etc.



## III. Holding Power of School.

1. Power of school to keep pupils on membership roll.
  - a) Age-grade tables by sex, buildings, and by combination of buildings.
  - b) Tables showing years in school and progress made by sex and buildings.
  - c) Percentage of old, young, or normal age for grade by sex and buildings.
  - d) Number and percentage of pupils, by time of year and grades, above compulsory school age leaving school.
  - e) Kind of pupils eliminated—dull, fair, bright.
  - f) Percentage that enter any one grade that persist to the next grade.
2. Maintenance of regular attendance of pupils on membership roll.
  - a) Percentage of attendance by sex, grades, buildings, rooms, months.
  - b) Tardiness—same as under *a*.
  - c) Attendance table by number of days attended during year.

## IV. Degree to Which Pupils Make Regular Promotions.

1. Failures.
  - a) Percentage of failures by age, grade, subject, sex, buildings, rooms.
  - b) Effect of failure on succeeding term's work.
    - (1) In subjects failed in.
    - (2) In subjects passed during first term.
2. Repeaters.
  - a) Tables by age, grade, subject, sex, buildings, rooms.
  - b) Percentage of increase or decrease for a period of years.
  - c) Cost to system to reteach repeaters.
3. Retardation and acceleration statistics.
4. Distribution of withdrawals as to age, grade, buildings, etc.

## V. Quality of Passing Work Done by Pupils.

1. Distribution by sex, grades, subjects, buildings, of grades made, showing number and percentage of grades made falling in the various groups as failing, fair, good, excellent, etc.

## VI. Measures to Preserve Health and to Protect Life.

1. Protection from fire.
2. Sanitary precautions in care of buildings.
3. Physical training facilities.
4. Hygiene of instruction.
  - a) Specimen schoolroom programs showing various combinations of grades.
  - b) Amount of home study required, by grades.

5. Medical inspection.
  - a) Kinds and frequency of examinations of buildings, children, and employees.
  - b) Relation of defects discovered to defects remedied.

VII. Tests to Discover Actual Efficiency of Pupils.

1. General efficiency.
  - a) Binet-Simon tests to be given to backward children.
2. Efficiency in school subjects.
  - a) Courtis tests.
  - b) Writing tests—either Thorndike or Ayres.
  - c) Hillegas—tests in composition.
  - d) Buckingham—tests in spelling.

TEACHER

I. Number of teachers employed by sex, grade taught, years of experience.

II. Qualifications.

1. Actually possessed by present corps.
  - a) Academic training.
  - b) Teaching experience.
    - (1) Experience in local system.
    - (2) Experience in present position.
    - (3) Total teaching experience.

III. Permanency of Teaching Corps.

IV. The Work of the Teacher.

1. Number of pupils per teacher.
2. Number of classes per teacher.
3. Number of preparations per teacher.
4. Total amount of time per week teacher is required to spend on school work.
  - a) During school hours.
  - b) Outside of school hours.
5. Degree to which teachers are consulted concerning—
  - a) General school policies.
  - b) Making of course of study.
  - c) Selection of supplementary material.
  - d) Change of textbooks.

V. Teachers' Meetings.

1. Kind, frequency, purpose.
2. Sample programs for various types of meetings.

## VI. Salaries.

1. Actual salaries paid in each class of position.
2. Comparison of salary with that paid in towns of approximately same size in state.

## FINANCES

- I. Comparison of local school system with other systems in regard to assessed valuation and relative amount of taxes devoted to education and taxes devoted to all other purposes.
- II. Receipts.
  1. Sources and amounts.
  2. Rate of increase in proportion to number of children to be educated.
- III. Expenditures.
  1. Classified according to a system similar to one recommended by National Bureau of Education.
  2. Per capita cost of various subjects and of various items of general expense based upon average number belonging or average daily attendance.
- IV. Summarize Expenses according to Plans Suggested by—
  1. Spaulding in the Newton, Massachusetts, reports.
  2. Goodnow and Howe, in New York City survey.
- V. Estimate Receipts and Expenditures for Next Two or Three Years.

## MISCELLANEOUS ITEMS

- I. School Sessions.
  1. Length of school year, week, day, recitation period.
- II. Educational Problems Now Being Investigated by Local Corps.
- III. Present Needs of System as Arrived at from Educational Survey.
- IV. Constructive Suggestions as to How These Needs Can Be Efficiently Met without Undue Burden from Taxation.

## A MORE ELABORATE OUTLINE FOR MAKING AN EDUCATIONAL SURVEY

## FACTS ABOUT STRUCTURE AND EQUIPMENT OF SCHOOL PLANT

- I. General Facts about Each Building.
  1. Location.
    - a) Map showing various school districts and location of each building.
    - b) Photograph of each building.
  2. General plan of building.
    - a) Floor plans.
    - b) Arrangements for traditional school subjects and activities.

- c) Arrangement for new and special school subjects and activities.
- d) Uses other than school uses.
  - (1) Planned for in original construction of building.
  - (2) Provided for by modifications of building.
- e) Size and present condition of the building.
  - (1) Total cubic feet of building space.
  - (2) Ground area of building in square feet.
  - (3) Number of stories.
  - (4) Construction cost per cubic foot of space.
  - (5) Present value.
  - (6) Date of erection.
- f) Material.
  - (1) Outside walls.
  - (2) Roof.
  - (3) Floors.
    - (a) Basement.
    - (b) Halls and corridors.
    - (c) Stairways.
    - (d) Recitation rooms.
    - (e) Toilet-rooms.
    - (f) Gymnasium.
- g) Protection from fire.
  - (1) Fireproof, not fireproof, slow-burning.
  - (2) Fire escapes, number and size.
  - (3) Exits and stairways, width and number.
  - (4) Number of pupils to the linear foot of entrance and exit space.
  - (5) Doors swinging in or out.
  - (6) Fire extinguishers within the building.
  - (7) Other fire-fighting apparatus.
  - (8) Automatic latches on doors as safeguard in case of fire or panic.
  - (9) Boiler-room inside or outside of building.
- h) Heating and ventilation.
  - (1) Kind of heating plant.
    - (a) Stoves with or without jackets or screens.
    - (b) Hot-air furnace.
    - (c) Hot water.
    - (d) Steam.
    - (e) Combination.
  - (2) Method of ventilation.
    - (a) Doors and windows only.
    - (b) Gravity system.
    - (c) Fan or force system.

- (3) Air humidifier.
- (4) Automatic heat regulation.
- i) Rooms and hallways, number and size.
  - (1) Recitation rooms.
  - (2) Laboratories.
  - (3) Rooms for special work.
  - (4) Assembly room.
  - (5) Other miscellaneous rooms.
  - (6) Halls and corridors.
    - (a) Floor space.
    - (b) Floor space per child in average daily attendance.
  - (7) Number of rooms unoccupied.
  - (8) Number of rooms occupied.
  - (9) Number of sittings.
  - (10) Building space area and volume used for boiler-room, and storage.
  - (11) Cloak-rooms separate or in connection with recitation rooms.
- j) Teachers and pupils in each building.
  - (1) Number of pupils enrolled.
  - (2) Number of teachers assigned to each building.
- k) Steps and stairways.
  - (1) Number of steps to reach first floor.
  - (2) Stairways.
    - (a) Number of.
    - (b) Number of steps to each.
    - (c) Height of risers.
    - (d) Width of steps.
    - (e) Width of stairways.
    - (f) Landing between floors.
    - (g) Double or single stairways.
    - (h) Fireproof or not.
    - (i) Lighting.
    - (j) Length of stairways between landings.
    - (k) Hand rails.
- l) Drinking facilities.
  - (1) Source and purity of water supply.
  - (2) Pail and common drinking-cup.
  - (3) Pail and individual drinking-cup.
  - (4) Faucet and common drinking-cup.
  - (5) Faucet and individual drinking-cup.
  - (6) Pump and common drinking-cup.
  - (7) Pump and individual drinking-cup.



- (8) Drinking-fountains.
  - (a) Number and kind.
  - (b) On single floor or on all floors.
  - (c) Average number of pupils to each drinking-fountain.
- m) Washing facilities.
  - (1) Ordinary wash-basin.
  - (2) Flowing water.
  - (3) Number of wash-stands.
  - (4) Number of pupils to each wash-basin.
  - (5) Soap.
    - (a) Is soap furnished?
    - (b) Liquid or solid.
  - (6) Towels.
    - (a) Are towels furnished?
    - (b) Common or individual cloth towels.
    - (c) Paper towels.
- n) Toilet accommodations.
  - (1) Outside of building.
    - (a) Screens.
    - (b) Distance from building.
    - (c) Distance of boys from girls.
  - (2) Inside.
    - (a) Smead or flush system.
    - (b) Location.
      - i. In basement or where.
      - ii. In path of sun's rays or not.
      - iii. Individual flush pull.
      - iv. Automatic flush.
  - (3) Accommodations for boys.
    - (a) Toilet seats.
      - i. Kind.
      - ii. Number.
      - iii. Number of boys per seat.
    - (b) Urinals.
      - i. Number.
      - ii. Number of boys to one urinal.
  - (4) Accommodations for girls.
    - (a) Number of toilet seats.
    - (b) Number of girls to a seat.
  - (5) Toilets and urinals, how ventilated.

## II. Specific Facts about Each Room.

1. Name of building.
2. Number of room.
3. Use made of room.
4. Number and grade of pupils accommodated.
5. Seating.
  - a) Chairs or desks.
  - b) Desks.
    - (1) Number and size of single non-adjustable.
    - (2) Number and size of single adjustable.
    - (3) Number and size of double non-adjustable.
    - (4) Number and size of double adjustable.
    - (5) Per cent of sittings in the room adjustable.
6. Size and dimensions.
  - a) Height.
  - b) Width.
  - c) Length.
  - d) Total number cubic feet.
  - e) Number cubic feet per child in average daily attendance.
  - f) Total square feet of floor space.
  - g) Number square feet of floor space per child in average daily attendance.
  - h) Width of aisles.
  - i) Width of space in front and in back of room and on sides.
  - j) Blackboards.
    - (1) Material.
    - (2) Length.
    - (3) Width.
    - (4) Height from floor.
    - (5) Total number square feet.
    - (6) Number square feet per pupil in average daily attendance.
  - k) Doors swing in or out.
  - l) Closets.
    - (1) Number.
    - (2) Dimensions.
    - (3) Cubic area.
    - (4) Shelf area.
  - m) Lighting.
    - (1) Number of windows.
    - (2) Dimensions of each window inside window frame.
    - (3) Total light area.

- (4) Ratio of window to floor space.
- (5) Height of window from floor.
- (6) Nearness of top of window to ceiling.
- (7) Relation of height of top of window to distance across room.
- (8) Arched or square tops.
- (9) Area of wall space separating windows.
- (10) Light from one side only.
- (11) Light from two adjacent sides.
- (12) Light from two opposite sides.
- (13) Light from three sides.
- (14) Light from four sides.
- (15) Kinds of window blinds.

*n*) Decorations.

- (1) Color of walls and ceiling.
- (2) Frequency of decorating walls and ceiling.
- (3) Number, size, and value of pictures.
- (4) Number, size, and value of pieces of statuary.
- (5) Value of all usable equipment.
- (6) Value of all usable equipment per child in average daily attendance.
- (7) Value of all decorative equipment per child in average daily attendance.

III. Equipment of Building as a Whole (following in many respects Dr. Bobbitt's outline).

1. Library.

- a*) Number of books of fiction.
  - b*) Number of books of history.
  - c*) Number of books of biography.
  - d*) Number of books of poetry.
  - e*) Number of books of science.
  - f*) Number of books of reference.
  - g*) Number of current event magazines.
  - h*) Number of miscellaneous magazines.
  - i*) Number of each of above per child enrolled.
  - j*) Method of providing funds for library.
2. Number and value of pianos.
    - a*) Value per child enrolled or in average daily attendance.
  3. Number and value of organs.
    - a*) Value per child enrolled or in average daily attendance.
  4. Number and value of victrolas.
    - a*) Value per child enrolled or in average daily attendance.

5. Number and value of piano-players.
    - a) Value per child enrolled or in average daily attendance.
  6. Number and value of records for victrolas and piano-players.
    - a) Value per child enrolled or in average daily attendance.
  7. Number and value of other musical instruments.
    - a) Value per child enrolled or in average daily attendance.
  8. Supplementary readers.
    - a) Fields of work in which they are furnished.
    - b) Number of sets.
    - c) Number of individual books not in sets.
    - d) Total number of all such books.
    - e) Value per pupil in average daily attendance.
  9. Wall maps.
    - a) Number.
    - b) Value.
    - c) Value per pupil in average daily attendance.
  10. Globes.
    - a) Number.
    - b) Value.
    - c) Value per pupil in average daily attendance.
  11. Other equipment like stereopticon, lantern slides, etc.
    - a) Value of all such.
    - b) Value per pupil in average daily attendance.
- IV. Extension of Plant during Current Year.
1. Treat according to previous outline.
  2. Give procedure in erection of new buildings or improvement of old buildings.
- V. Extension of Equipment during Current Year.
1. Give for each building separately.
  2. Equipment added by efforts of—
    - a) School board.
    - b) Principals and teachers.
    - c) Children.
    - d) Patrons.

#### ORGANIZATION, ADMINISTRATION, AND SUPERVISION OF SCHOOLS

- I. General Organization (largely following suggestions by Goodnow and Howe).
  1. Legal organization of schools by state provision.
    - a) Brief history of legal provisions.
    - b) Present status.

- (1) Relation to state department of public instruction.
- (2) Relation to state board of education.
2. Administrative organization: co-ordination of authority as vested in—
  - a) School board.
    - (1) Brief historical evolution of school board in the state.
    - (2) Present legal relations of board to—
      - (a) State authorities.
      - (b) County authorities.
      - (c) City authorities.
    - (3) Number and method of selection and term of office of members of the board.
    - (4) Personnel of school board for period of years past.
    - (5) Qualifications.
    - (6) Organization.
      - (a) Officers.
      - (b) Committees.
    - (7) Salaries.
    - (8) Meetings.
      - (a) Place and time of meeting.
      - (b) Those present—board, superintendent, clerk, public.
      - (c) Regularity of attendance of members.
      - (d) Length of meetings.
        - i. Illustrate by series of consecutive meetings.
      - (e) Minutes.
        - i. Prepared by whom.
        - ii. How recorded: give samples.
        - iii. Contents of minutes.
      - (f) Preparation of business for board.
    - (9) Efficiency of board.
      - (a) Give concrete examples showing efficiency of board in getting things done in a satisfactory manner and without loss of time.
    - (10) Give account of procedure in connection with getting new school buildings.
      - (a) Selection of architect.
      - (b) Advertising for bond sale.
      - (c) Sale of bonds, if bonds are sold.
      - (d) Receiving bids on building.
      - (e) Awarding contracts.



- (11) Powers and duties of the board.
  - (a) Legislative powers exercised by board, such as—
    - i. Determining the kinds of schools and nature of instruction.
    - ii. Controlling conduct of schools by legislation.
    - iii. Determining under legal limitations who shall be admitted to school.
    - iv. Determining salaries and qualifications of teachers and providing for their appointment.
    - v. Same as (iv) for other employees.
    - vi. Regulating finances.
  - (b) Legislative powers delegated to—
    - i. Superintendent, such as—
      - [a] Changes in course of study.
      - [b] Selection of textbooks, apparatus, and other scholastic supplies.
      - [c] Nomination of teachers and other employees.
    - ii. Principals.
  - (c) Administrative powers exercised by board, such as—
    - i. Construction of buildings.
    - ii. Granting permission for outside use of school buildings.
    - iii. Final power in selection of and dismissal of employees on recommendation of superintendent.
    - iv. Levying taxes.
    - v. Issuing bonds.
    - vi. Selection of superintendent.
    - vii. Expansion of educational system.
    - viii. Authorizing changes proposed by superintendent.
  - (d) Administrative powers delegated to the superintendent, such as—
    - i. Approval of building plans.
    - ii. Improvements to grounds and buildings.
    - iii. Purchase of emergency materials, etc.
- b) Superintendent.
  - (1) Historical evolution of the office of superintendent in city and state.
  - (2) Qualifications and term of office.
  - (3) Powers and duties, such as—
    - (a) Providing and keeping all records and reports.
    - (b) Compilation of statistics.
    - (c) Custody of books and documents of the school board.
    - (d) Keeping of school board minutes.

- (e) Making minor rules relating to conduct of schools.
- (f) General supervision of instruction.
- (g) General supervision of course of study.
- (h) Nominating and assigning teachers.
- (i) Appointing teachers in time of emergency, and action ratified at next meeting of board.
- (j) Recommending salaries to be paid.
- (k) Power of dismissal with or without any special authority from board.
- (l) Expending money without any special authority.
- (m) Attending all board meetings and overseeing the writing-up of minutes.
- (n) Give list of routine things done by the superintendent during one week.
- (4) Clerical assistance allowed.
  - (a) List of duties of clerk.
- (5) Expenses to teachers' meeting allowed or not.
- (6) Office hours.
- (7) List of things actually done by superintendent in a period of from one to four consecutive weeks.
- c) Principals.
  - (1) Qualifications of present principals.
    - (a) Special interest in problems of school administration.
  - (2) Administrative and supervisory duties.
    - (a) List of things they do.
  - (3) Assistance given them.
    - (a) Clerk.
      - i. List of things clerks do.
  - (4) Amount of teaching done by principals.

## II. Business Administration.

### 1. Methods of bookkeeping.

- a) Give sample pages from various books used or of cards if card system is used.
- b) Enumerate the various accounts kept separately, such as those suggested by the National Bureau of Education.
- c) Give explanation of methods of recording so as to be easily accessible, payments of bonds, interest, and insurance.
- d) Methods of filing correspondence, reports, supplementary information in—
  - (1) School board office.
  - (2) Superintendent's office.

- (3) Principals' offices.
- (4) By special supervisors.
- (5) By heads of departments.
- (6) In recitation rooms for convenience of teachers.
- e) Samples of important reports and records, individual and summary, regarding attendance and progress of pupils.
  - (1) Reports for general office.
  - (2) Reports for benefit of teachers and principals in efficient management of an individual building.
- f) System of ordering, distributing, and keeping track of supplies.
  - (1) To be consumed in ordinary work of the school, such as—
    - (a) Chalk.
    - (b) Paper.
    - (c) Pencils, etc.
  - (2) Non-destructible, such as—
    - (a) Erasers.
- g) System of keeping adequate track of minor purchases for repairs of buildings, etc.
- h) System of keeping adequate track of supplementary readers and other helps when passed from room to room within the building or between the buildings.
- 2. Operation of physical school plant.
  - a) Organization for keeping plant open and in operation.
  - b) Care of building.
  - c) Protection of building by insurance.
    - (1) Show proportion of real value of each building insured against—
      - (a) Fire.
      - (b) Storm.
      - (c) Earthquake.
  - d) System for furnishing and checking up consumption in janitors' supplies.

### III. Educational Administration.

- 1. Teaching corps.
  - a) Provision of.
  - b) Methods of increasing permanence of.
  - c) System of improving qualifications of teachers already in service.
- 2. Supervision of actual schoolroom teaching.
  - a) List of important points determining teacher's success.
  - b) Concrete statement of method of keeping track of improvement in work.

- c) Statement of various things done within a limited period of time in an attempt to improve the classroom work of some specific teacher.
  - (1) Things done by superintendent.
  - (2) Things done by principal.
  - (3) Things done by special supervisor.
- 3. Supervision of course of study.
  - a) In whom is authority vested for making?
  - b) In making course are services enlisted of—
    - (1) Superintendent?
    - (2) Supervisors?
    - (3) Principals?
    - (4) Teachers?
  - c) Explain the method by which co-operation is secured.
    - (1) Illustrate in detail by the use of a specific subject in the curriculum.
  - d) What organized method is used to insure continued growth and change in the course of study?
  - e) Upon what bases is the need of changes determined and met?

## COURSE OF STUDY

- I. Different Subjects Included in the Course of Study.
  - 1. Names of subjects.
  - 2. Date of introduction of each subject.
  - 3. Pressure back of introduction of each subject.
  - 4. Brief outline of course in each subject.
  - 5. Place in course where each subject begins and ends.
  - 6. Amount of time allowed to each subject each week.
    - a) For preparation on part of pupil.
    - b) For recitation.
  - 7. School exhibits regularly or occasionally made in connection with various subjects of the curriculum.
  - 8. Time required for average child to complete each year of the course.
    - a) In primary grades by years only.
    - b) In department and high school by both years and subjects.
  - 9. Co-ordination or correlation of different subjects.
  - 10. Summary of unique variations from traditional courses or methods of presenting them.
- II. Number of Pupils and Percentage of Total School Enrolment, taking Each Subject in Each Grade.

## III. Subjects or Parts of Subjects That Are Optional.

1. With teacher.
2. With pupil.

## IV. Objective Measurements, if Possible, of Degree to Which Teachers Follow Course of Study.

## V. Ways in Which Course of Study is Made Suggestive to Teachers.

## VI. Organization of Course to Meet Varying Individual and Class-Group Abilities.

## VII. Textbooks in Use.

1. List of.
2. State uniformity or local discretion.
3. Method of adoption in each case.
4. Are books furnished free to all children?
5. How are poor children supplied with books?
6. How often are books changed?
7. Are they all changed at one time or gradually?
8. Cost per pupil for each grade—
  - a) If new books are bought by pupils each term.
  - b) If books are held from term to term and used in succeeding grades where possible.
  - c) If books are furnished by school.
9. List of sets of supplementary books by grades.
  - a) Method of selection of supplementary books.

## THE CHILD

## I. School Census.

1. Taking of census.
  - a) Time of year taken and how taken.
  - b) Legal provisions.
  - c) Method of taking.
    - (1) Exhibit blanks.
  - d) Pay for taking.
  - e) Who takes census?
  - f) What constitutes school age for census purposes?
2. Census statistics.
  - a) Enumeration for five years back by years, sex, and nationality.
  - b) Homes represented in the last enumeration.
    - (1) Number.
    - (2) Number having one, two, three, four children of school age.
    - (3) Number having more than four children of school age.
    - (4) Times family moved during school history of children.



- c) Enumeration by wards and years, showing number and percentage of yearly increase or decrease.

## II. Enrolment Statistics for Purpose of Showing Efficiency of System in Getting Pupils into School.

1. Enrolment for several years past by race, nationality, and sex.
2. Enrolment by grades—percentage of total enrolment in each grade.
3. Distribution of pupils by grades and occupation and education of parents.
4. Nativity census of enrolment.
  - a) Number born in city.
  - b) Number born in county outside of city.
  - c) Number born in state outside of county.
  - d) Number born in each of the states.
  - e) Number born in foreign countries.
  - f) Number birthplace unknown.
5. Distribution of enrolment at various dates during term.
 

a) First day.	{ Percentage each is of first day's enrolment.
b) First week.	
c) First month.	
d) Each succeeding month.	
6. Enrolment by age and sex of pupils new to the system.
7. Enrolment in high school by subjects and years.
8. Enrolment by departments—high school, grammar, primary.
9. Show visually relative number of pupils in each grade.
10. Graphic presentation of increase of census over enrolment.
11. Beginners by age and sex. Show age at which pupils first enter school.
12. Number and percentage of pupils living outside the corporation but attending school in the city.
13. Number and percentage of pupils entering system for first time, showing how many school systems have contributed to the present educational status of the pupils.
14. Number and percentage of children in school that have had all of their education in local system.
15. Ratio of number of children in school over compulsory age to the number within the compulsory age. Degree to which this ratio is increasing or decreasing.
16. Tuition of pupils by grades.
17. Grades pupils enter when entering from other systems.
18. State law and its efficiency in getting pupils in.

19. Machinery for enforcing the law in this regard.
- a) Truant officers.
    - (1) Method of election.
    - (2) Pay.
    - (3) Term of office.
    - (4) Duties and powers.
  - b) Blanks for reports.
  - c) Time given to work.
    - (1) Number of pupils enrolled for each hour of service per week.
    - (2) Cost per pupil per hour of service.
  - d) Absences.
    - (1) Legal.
    - (2) Illegal.
    - (3) Reports by buildings.
    - (4) By months.
  - e) Promptness of reporting cases to truant officer, also promptness of disposing of cases.
  - f) Disposition of cases.
  - g) Preventive measures.
  - h) How efficient is work? How many have to be dealt with two times? Three times, etc.?
  - i) Number of visits made by truant officer.
  - j) Number of cases reported and disposed of.
  - k) Probation plan.

### III. Holding Power of School.

- 1. Age-grade tables by sex.
- 2. Years-in-school and progress-made tables by sex.
- 3. Percentage of old, young, normal age for grade.
- 4. Number and percentage of pupils over five, six, seven, nineteen, twenty, etc.
- 5. Age distribution in various grades.
- 6. Percentage of children fourteen years of age or over who have reached grades 5, 6, 7, etc.
- 7. Number and percentage of children of fourteen years of age or over who returned to school after summer vacation.
- 8. Number and percentage of graduates, common- and high-school, who go ahead with school work.
- 9. Membership of each grade on basis of 100 beginners.
- 10. Median ages of pupils in each grade.
- 11. Withdrawals by age, sex, months, grades.
- 12. Causes of withdrawals.

13. Ratio by years of number of children in school over compulsory age to number within compulsory age.
14. Ratio of number over compulsory age in school to number over age according to school census.
15. Extent to which elimination takes place in the grades.
16. Pupils failing to return at the beginning of school in the fall.
  - a) Age.
  - b) Grade.
  - c) School record.
  - d) Reasons for leaving.
  - e) Attitude of parents.
  - f) Character of work secured, pay, how position was obtained, how new work was learned.
  - g) Was position secured the kind wanted?
  - h) Attitude of child toward evening school or part-time classes.
17. Number leaving high school last year without graduating.
18. Number of pupils by sex between fourteen and sixteen leaving school each year.
19. Grades in which pupils drop out.
20. Withdrawals by months.
21. Percentage entering school that graduate.
22. Percentage of total enrolment leaving in each grade.
23. Number and percentage of over-legal-age pupils returning after a failure.
24. Percentage of total enrolment found in each grade.
25. Percentage of fourteen-, fifteen-, sixteen-, etc., year-olds withdrawing before close of year.
26. Distribution of withdrawals by ages, and causes.
27. Number and percentage of those entering each grade that persist to next grade.
28. Number and percentage by grades and ages of those that drop out before reaching next grade.
29. Number and percentage by grades and ages of those entering any one year that persist to the next year.
30. Number and percentage by grades and ages of those entering one year that do not persist to the next year.
31. Kind of pupils eliminated.
  - a) Dull.
  - b) Average.
  - c) Bright.

32. Average length of school life by grades and ages of pupils over school age who return to school after a failure.
33. Conditions influencing pupils to leave school.
  - a) Statements as given by parents.
  - b) Statements as given by pupils.
  - c) School training of parents.
  - d) Attitude of parents toward further education for their children.
  - e) Occupation of parents.
  - f) Social status of parents.
  - g) Retardation of pupils.

#### IV. Maintenance of Regular Attendance after Pupils Are in School.

1. Percentage of attendance by sex, grades, months, rooms, buildings, and by previous years.
2. Tardiness same as 1. Also number of cases and number of separate pupils.
3. Causes of poor attendance and tardiness.
4. Attendance table by number of days.
5. Days in week and part of day that attendance is best.
6. Effect of specific subjects upon attendance and tardiness.
7. Table showing percentage of average daily attendance on average register as compared with previous years.

#### V. Degree to Which Pupils Make Regular Promotion.

1. Failures.
  - a) Figure percentage of failures by age, grade, and subject for each term for several terms.
  - b) Degree to which examinations are responsible for failure—
    - (1) In several grades below the high school.
    - (2) In high school.
  - c) Percentage of those entering system for first time that fail.
  - d) Effect of failure on succeeding term's work—
    - (1) In subjects failed in.
    - (2) In subjects passed in during first term.
  - e) Distribution of pupils by subjects and failures, by age and failures, by grades and failures.
2. Repeaters.
  - a) By age, grade, sex, building, teacher, for several terms.
  - b) Percentage of increase and decrease.
  - c) Cost to reteach repeaters.
3. Retardation.
  - a) Relation of absences to retardation.
  - b) Relation of various other factors to retardation.

- c) Retardation for each grade for those that have had 1, 2, 3, 4, 5 years in local system of schools compared with pupils from outside.
  - d) Average retardation of those entering system.
  - e) Retardation—
    - (1) In the system.
    - (2) By the system.
    - (3) By other systems.
  - f) Percentage of waste—ratio of number of points failed to number of points earned.
  - g) Of number enrolled give number and percentage making no credits, one credit, two credits, etc.
  - h) Comparative performance of failing pupils with various teachers in various grades.
4. Acceleration.
- a) Same as for retardation.
  - b) Plans for promoting acceleration and avoiding retardation.
    - (1) Semiannual promotions.
    - (2) Promotions by subjects.
    - (3) High-school subjects offered in grades.
    - (4) Special groups—strong and weak.
      - (a) Number of pupils ahead of grade by grades.
      - (b) Number of pupils behind grade by grades.
    - (5) Special teachers.
    - (6) Separation of sexes.
    - (7) Adjusting courses of study to pupils.
    - (8) Supervised study.
    - (9) Summer school.
    - (10) Notifying parents of delinquencies.
    - (11) Table showing by grades number of pupils receiving one or more promotions during the year.
    - (12) Precautions against pushing brilliant pupils too rapidly.

## VI. Quality of Passing Work Done by Pupils.

- 1. Distribution of grades made showing number and percentage of the grades made falling within the various groups as follows: failing, fair, good, excellent, etc.; or 95-100; 90-95; 85-90; 80-85; 75-80; below 75, if 75 is passing mark.
  - a) Distribute for whole school in all subjects.
  - b) Distribute for each year and by groups of years in all subjects.
  - c) Distribute by subjects for all years combined.
  - d) Distribute by subjects and years.
  - e) Distribute also by age and sex.



2. In all of above find middle 50 per cent and show graphically as well as by tables.
3. Comparative performance of pupils trained—
  - a) In local school and in schools in other corporations.
    - (1) Compare as to—
      - (a) Entrance age in any particular grade.
      - (b) Attendance.
      - (c) Quality of work previously done.
    - (2) Comparison as to work done—
      - (a) By subjects—
        - i. As to scholarship, showing median grades and distribution as to rank.
  - b) Same for pupils trained in certain grades in different buildings of local system and coming together later on for departmental or high-school work.
  - c) Same for pupils trained in same building by different teachers and later grouped together under one teacher. Such analysis helps materially in locating teachers whose work persists as pupils advance.
4. Degree to which pupils maintain their standing when they enter other systems of schools through moving.
5. Performance of high-school graduates when they enter higher institutions of learning compared with graduates from other systems of schools.
6. Age of pupils in each grade of school work making each quality of grade. Are "excellents," for instance, made by under-age, normal, or average pupils?
7. Measure retention of rank as far as grades are concerned as pupil advances in work.
  - a) Retention of rank from year to year by years and subjects.
  - b) Retention of rank throughout the succeeding part of the course with any one year taken as a basis.
  - c) Measure effect on future work of double promotions.

## VII. Correlations That Could Profitably Be Worked Out.

1. Correlation of grades in the various subjects in any one term or series of terms.
2. Correlation of retention of rank by terms and by subjects—
  - a) From term to term.
  - b) Throughout the course with any one year taken as a basis.
3. Correlation between visual acuity and scholastic standing of pupils in various common- and high-school branches.

4. Correlation of auditory acuity and scholastic standing of pupils in various common- and high-school subjects.
5. Correlation of any physical defect with scholastic standing of pupils in various common- and high-school subjects.
6. Distribution of vision groups among intelligence groups in various common- and high-school subjects.
7. Distribution of auditory groups among intelligence groups in various common- and high-school subjects.
8. Attendance of pupils and occupation of parents.
9. Attendance of pupils and progress made in school work.
10. Occupation of parents and school progress made by pupils.
11. Deportment of pupil and school progress of pupil.

#### VIII. Graduates.

1. Number and percentage of pupils reaching any particular grade continued to—
  - a) Graduation from common schools.
  - b) Graduation from high schools.
2. Number and percentage of those who finish either common schools or high schools who finish in the normal number of years of work.
3. Number and percentage of those who finish either common or high schools who finish at the normal age.
4. Number and percentage of high-school graduates that—
  - a) Enter college.
  - b) Finish one, two, three years.
  - c) Graduate.

#### IX. Measures to Preserve Health and to Protect Life.

1. Protection from fire.
  - a) Fire drills.
    - (1) Directions for giving.
    - (2) Time necessary to empty building.
    - (3) Frequency of drills.
  - b) Exits and stairways, width and number.
  - c) Doors opening outward.
  - d) Automatic latches.
  - e) Degree of fireproofing in the building.
  - f) Fire extinguishers.
  - g) Wiring insulated.
  - h) Firebox of boilers sufficiently removed from inflammable material.
  - i) Rubbish in basement.

## 2. Sanitation.

- a) How often are furniture, woodwork, and floors washed?
- b) How often are rooms disinfected?
- c) Rooms cleaned by—
  - (1) Broom.
  - (2) Oil.
  - (3) Brush.
  - (4) Vacuum cleaning.
  - (5) Dry sweeping.
  - (6) How dusted?
- d) Wall cleaned or brushed down. Frequency.
- e) Erasers and chalk ledges and blackboards cleaned how often by—
  - (1) Janitors?
  - (2) Teachers?
  - (3) Pupils?
- f) Windows washed how often?
- g) How often are all marks, carvings, etc., removed and furniture revarnished?
- h) Toilets.
  - (1) How often and how cleaned?
  - (2) Lighting.
  - (3) Ventilation.
  - (4) Sunshine.
  - (5) Toilet paper furnished?
- i) How often is air changed in room?
- j) Is air washed and humidified?
- k) Temperature of recitation rooms.
- l) Drinking-fountains.
  - (1) Same as before described.

## 3. Physical training provisions.

- a) Provisions for indoor and outdoor play and games.
- b) Classroom gymnastics.
- c) Gymnasium or hall gymnastics.
- d) Correctional exercises.
- e) Athletic teams and leagues.
- f) Swimming.
- g) Bathing.
- h) Boy Scout organization.
- i) Camp Fire Girls organization.
- j) Folk dancing.
- k) Formation of personal hygiene habits.
- l) Instruction in feeding, clothing, and sleep of pupils.

- m*) Instruction in use of toothbrush.
- n*) Instruction in detrimental effects of use of coffee, tobacco, narcotics.
- 4. Hygiene of instruction.
  - a*) Specimen of schoolroom programs showing various combinations of grades.
  - b*) Does the type of print pupils are called upon to read suit the eyes?
  - c*) Methods used to prevent overstrain and other detrimental by-products resulting from strenuous effort on part of teacher or school system to maintain a high degree of efficiency.
  - d*) Are lighting and seating up to standard?
  - e*) Degree of home study required in the various grades.
- 5. Medical inspection.
  - a*) History of, in local system.
  - b*) Number of officers.
  - c*) Salaries.
  - d*) Time given to work.
  - e*) Cost per hour of examiner's service.
  - f*) Cost per week per pupil enrolled.
  - g*) Purposes of inspection.
  - h*) Scope of work.
    - (1) Frequency of examination of children.
    - (2) Frequency and thoroughness of inspection of sanitary condition of buildings.
    - (3) Exclusion of children suffering from contagious diseases.
    - (4) Special examination of mental defectives.
    - (5) Examination of all children absent on account of sickness before giving entrance certificates.
    - (6) Periodical examination of all children in case of epidemic.
    - (7) Examination of teachers or other employees at initiation of inspector or at direction of board.
  - i*) Relation of defects discovered to defects remedied? Is this ratio increasing or decreasing?
  - j*) Forms used.
  - k*) Emergency help.
    - (1) When inspector cannot do all the work are others called in to help?
  - l*) Causes of exclusions by years, time of year, and sex.
- 6. Health talks by physicians.
- 7. Teaching of hygiene.
  - a*) How low in the grades is it taught?
  - b*) Essential topics emphasized.

**X. Tests to Discover Actual Efficiency of Pupils.**

1. General efficiency.
  - a) Binet-Simon.
2. Efficiency in school subjects.
  - a) Teachers' estimates in term reports.
  - b) Final examinations.
    - (1) History of how they are made.
    - (2) Samples of them.
    - (3) Forms for reports on these tests.
    - (4) Amount they count.
3. Other tests.
  - a) Stone tests in arithmetic.
  - b) Courtis tests in arithmetic, reading, language, and handwriting.
  - c) Writing—Thorndike or Ayres.
  - d) Composition—Hillegas tests in composition.
  - e) Thompson's minimum essentials.
  - f) Buckingham tests in spelling.

**XI. Employment of Children.**

1. How pupils were employed last summer by age, grade, sex.
2. Same for other holiday periods: Saturdays, Christmas.
3. Number of pupils partially supporting themselves during school and what they do; also recompense.
4. Relation between kind of jobs pupils have during summer who did not return to school and those who gave up their positions and returned to school.
5. Table of workers by age, sex, and those returning and those not returning.
6. Average age of workers by grades.

**XII. Pupil Activities.**

1. Athletics.
2. Plays.
3. Papers and other publications.
4. Clubs.
  - a) Fraternities.
  - b) Subject clubs.
  - c) Literary.
  - d) Debating and other organizations.

**XIII. Summary Tables in Regard to Above Points.**



## TEACHERS

**I. Number of Teachers Employed.**

1. By sex.
2. By years, grades, and subjects.
3. Show yearly increase or decrease in above.
4. By sections of country from which teachers are drawn.
5. By years of experience.

**II. Qualifications.**

1. Required—board ruling.
2. Of present corps.
  - a) Academic training.
  - b) Experience in teaching.
    - (1) Total years' experience.
    - (2) Experience in local system.
    - (3) Experience in present position.
  - c) Kind of license held.
  - d) Sample of blank required to be filled by all applicants for positions.

**III. Terms of Appointment.****IV. Nominations Made by Whom?****V. Permanency of Teaching Corps.**

1. Table to show the percentage of teachers for the various periods of service.
2. List of all teachers who have resigned and reasons for resigning.
3. Increase of salaries in new positions.
4. Percentage of those changing each year in grades and high school.

**VI. The Work of the Teacher.**

1. Number of pupils per teacher.
  - a) Enrolment.
  - b) Average belonging.
  - c) Average daily attendance.
2. Number of classes to the teacher.
3. Number of recitations to the teacher.
4. Total class time of teacher.
5. Additional required time at school—minutes per week.
6. Time spent in school work away from school.
7. Total time given to school work—minutes per week.
8. Total time at school—minutes per week.
9. Time at teachers' meetings—minutes per month.
10. Number of educational books read during a limited period of time.

11. Number of educational journals read regularly.
12. For each teacher in high school and for each period of the day—
  - a) Grade taught.
  - b) Subject taught.
  - c) Number pupils.
  - d) Minutes recitations per week.
  - e) Minutes laboratory or shop work per week.
  - f) Minutes study work per week.
  - g) Minutes consultation per week.
13. Table showing increase or decrease in size of classes and percentage of increase or decrease.
14. Degree to which teachers are consulted concerning—
  - a) General school policies.
  - b) Making course of study.
  - c) Selection of supplementary material.
  - d) Change of textbooks.
15. Give samples of assignment made in various subjects by teachers.

#### VII. Improvement of Teachers through—

1. Observation of teaching within the system.
2. Visits to neighboring towns.
3. University extension work or summer-school work.
4. Leave of absence.
5. Travels.
6. Reading.
7. Lectures to teachers.

#### VIII. Teachers' Meetings.

1. General, district, state, or national attended.
2. Meetings with supervisors.
  - a) Drawing.
  - b) Music.
    - (1) Required.
    - (2) Voluntary.
  - c) Writing.
  - d) Physical education.
  - e) Give samples of work done in above meetings.
3. Meetings with new teachers and superintendent at beginning of school.
4. General meeting at beginning of school—
  - a) Of principals and superintendent.
    - (1) Give list of subjects discussed.

- b) Of all teachers and superintendent.
- c) Meeting of teachers with principals preceding opening of school.
- 5. Meetings during year—
  - a) With principals.
    - (1) For building problems.
    - (2) For professional work.
  - b) With superintendent and principals.
    - (1) Grade meetings.
    - (2) Course-of-study meetings.
    - (3) Visiting-day meetings.
    - (4) Special-subject meetings.
    - (5) Examination-questions meetings.
    - (6) Meetings with truant officer.
    - (7) Meetings for presentation and explanation of plans and methods of instruction applicable to all grades.
    - (8) Give examples of work done in each type of above meetings.

#### IX. Income.

- 1. Salaries.
  - a) Table showing number of teachers at various salaries in elementary and high schools.
  - b) Percentage of increase in past years.
  - c) Compare second with increase in cost of living.
  - d) Basis for determining salary.
    - (1) Quality of license.
    - (2) Experience.
    - (3) Grade taught.
    - (4) Success as a teacher.
- 2. Other income.
  - a) Vacation work.
  - b) Other sources.
- 3. Number and percentage of teachers having to support others than themselves.
- 4. Pension system.

#### X. Freedom of Teachers to Experiment.

##### FINANCES

- I. Comparison of Local School System with Other Systems in Regard to Assessed Valuation and Relative Amount of Taxes Devoted to Education and Taxes Devoted to All Other Purposes.

## II. Receipts.

## 1. Directly by board.

## a) From state.

(1) Basis of distribution of this fund by **state**.

## b) Local.

(1) From taxation.

(a) Designate the various **funds**.

(2) From tuition.

(a) Cash by pupils.

(b) From township trustees for **transfers**.

(3) From other sources.

(a) Interest on deposits.

(b) Sale of bonds.

(c) Sale of property.

(d) Refunds from errors.

(e) Sale of textbooks.

(f) Sale of manual-training and domestic-science **products**.

(g) Any other sources.

c) Taxation, total and for school purposes for several years past.

2. Received by principals of the several buildings for various purposes.

3. Limitations on use of funds.

4. Resources from various funds for several years past.

## III. Expenditures.

## 1. Basis of paying out money.

## a) Original order.

b) Bills approved by comparison with original order and goods received.

c) Recommended for payment by superintendent.

d) Ordered paid by board.

e) Mailed by whom?

2. Per capita cost based on population twenty-one years of age or over, total population, school enrolment, number belonging, average daily attendance, or students per hour of instruction in—

a) Manual training.

b) Sewing.

c) Drawing supervision.

d) Music supervision.

e) Elementary schools.

f) High schools.

g) Separate subjects in high schools.

h) Various items of expenditure.

- i) Various types of expense.
  - (1) Instruction.
  - (2) Administration.
- j) Various buildings.
- k) Various buildings by types of expenditures.
- 3. Compare local system with other cities in regard to above items of expense.
- 4. Summaries of expense.
  - a) For past five or ten years.
  - b) For past two years in detail according to plan of—
    - (1) Spaulding.
    - (2) Goodnow and Howe.
  - c) Estimated receipts and disbursements for future years.

## MISCELLANEOUS ITEMS

- I. Educational Problems Being Investigated at Present by—
  - 1. Superintendent.
  - 2. Individual principals.
  - 3. Individual teachers.
  - 4. Individual buildings.
  - 5. Other co-operative studies.
- II. School Sessions.
  - 1. Length of year.
  - 2. Length of week.
  - 3. Length of day.
  - 4. Length of recitation period.
  - 5. Time building is open for admission of pupils.
  - 6. Time teachers are required to be present.
  - 7. Length of recess and noon intermission.
- III. Improvements in Various Lines during Limited Number of Years.
- IV. Present Needs of System as Arrived at from Educational Survey.
- V. Constructive Suggestions as to How These Needs Can Be Efficiently Met without Undue Burden from Taxation.

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## SUMMARY OF TYPICAL SCHOOL SURVEYS

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During the year 1913 the Committee of the National Council of Education known as the Committee on Tests and Standards of Efficiency in Schools and School Systems found that it required in its work a summary of such school surveys as had up to that time been completed. The Committee accordingly directed its secretary to collect copies of such surveys and render a report on them. The report was sent to members of the Committee on June 30, 1913, and was substantially the same as the following. Additions to the report as then made are included in the following pages covering New York, Ohio, Portland, Michigan, Philadelphia, and the Carnegie Foundation surveys. New York was not included in the report to the Committee because it was so well known to all the members. Ohio, Portland, Vermont, Michigan, and Philadelphia had not at that time been surveyed. The medical report of the Carnegie Foundation is also added, because it certainly belongs in any list of typical surveys.

The summary of school surveys now presented is not complete, but it includes all of the major surveys and gives a view of the different types of such inquiries. The chronology of reports is respected in a general way and the reader will certainly not fail to see that there has been a steady evolution in the methods of inquiry and in the form of presenting results.

### FIRST BOISE SURVEY

During one week in November, 1910, Superintendent Kendall, at the request of the School Board and the Superintendent, made a survey of the schools of Boise, Idaho. The report was published in a local newspaper, the *Idaho Statesman*, on December 18, 1910. It deals with (1) School Buildings, (2) Teachers, (3) Course of Study, (4) Organization of Schools, and (5) Attitude of the Community. The facts on which conclusions are based were collected through six days of personal observation. There are no tables in the report. Recommendations based on



personal observation are made and the report concludes with a brief statement by the Superintendent to the effect that Board action was taken along the various lines recommended. The report is favorable and the recommendations are all in the direction of enlargement—enlargement of the staff; enlargement of the course, especially by including more industrial courses; enlargement of the organization by adding ungraded classes. The report is 6 pages in length.

#### MONTCLAIR SURVEY

In May, 1911, Professor Hanus reported to the Board of Education of Montclair, New Jersey, on the schools of that city. The report deals with (1) General Survey, (2) Teachers and Teaching, (3) Program of Studies in (a) Elementary Schools and (b) High Schools. The report was printed in a pamphlet. The body of the report is 21 pages in length and contains numerous tables and reports of personal observations, the latter apparently based on four days of visiting in the schools. Criticisms are made in detail and numerous recommendations are made.

The tables include: (1) a table of marks in the high school comparing Montclair grades with those in other high schools; (2) a table of time distribution of subjects in grades comparing Montclair and Newton, Massachusetts; (3) general tables of retardation, average ages, and reasons for leaving school; for one school a detailed table of ages and a table of nationalities.

The recommendations on course of study are specific and detailed. The criticisms on general organization are based on the tables. The high school is criticized in its material equipment and in its course of study.

Professor Hanus notes explicitly at the end of his report that he has laid stress on what seemed to be the shortcomings of the Montclair schools and not on their many obvious merits.

#### BALTIMORE SURVEY

In June, 1911, a Commission consisting of United States Commissioner of Education E. E. Brown, Professor E. P. Cubberley, Superintendent C. N. Kendall, with two assistants, namely, Messrs. N. B. Hillegas and Harlan Updegraff, rendered a report to the Board of School Commissioners of the city of Baltimore on the schools of that city. This report was published as *Bulletin 1911, No. 4*, Whole Number 450, of the

United States Bureau of Education. The body of the text contains 102 pages. A summary of 8 pages precedes the detailed tables and reports and presents the findings of the Commission. The body of the report consists of five chapters. Chap. i (6 pages) describes the plan and history of the survey itself. Chap. ii (26 pages) gives a history of the Baltimore school system and an outline of the social and legal relations of the system. Chap. iii (44 pages) deals with the following topics: (a) System of Supervision; (b) Teaching Force and Its Training; (c) The Elementary Curriculum. Chap. iv (10 pages) deals with the physical conditions in the schools. Chap. v (9 pages) deals with various general topics.

The text includes numerous tables and charts. In many of these charts the Baltimore schools are compared with schools in the other leading cities of the United States.

This report contains much matter dealing directly with the problem of administration and supervision and with the criticisms of the administration. It is evident from the whole tone of the report that the Commission was expected to pass judgment, either favorable or unfavorable, upon the administration.

In point of method it may be noted that comparison with other cities is much emphasized. Personal inspection is recorded as having been made in one-half of the schools and in 250 classrooms. The statement regarding the scope of the report is especially full and suggestive for the use of those engaged in the study of surveys (pp. 18-19).

The report is fully indexed.

With regard to this survey it may be stated that it was made at a time when a controversy between the School Board and the Superintendent was at its height. The immediate effect of the report was small. The School Board, dominated by political motives, failed to reappoint the Superintendent, and many of the unfavorable conditions which are described in the report were allowed to continue or grow worse, while many of the strong policies for which the Superintendent had been working were allowed to lapse.

#### EAST ORANGE SURVEY

During the autumn of 1911 Professor Moore prepared for the Board of Education of East Orange a report on the schools of that city. The report was printed in a pamphlet of 64 pages early in 1912. Professor

Moore reports that he visited all of the classrooms in both elementary and high schools, talked with most of the teachers and supervising officers, examined the pupils in grades V, VI, VII, and VIII, and consulted with citizens. The report contains the following sections: (1) Historical Sketch; (2) Relation of School to Community; (3) Board of Education; (4) Cost of Schools; (5) General Survey; (6) Teachers; (7) A New Course of Study; (8) The High School; (9) Summary of Recommendations. The text contains tables, several comparing the schools of East Orange with those of other systems. The text is somewhat more general than that of other reports, making excursions into the general field of educational theory and urging conformity in the schools to the general principle that schools should train in thinking rather than in a set amount of subject-matter. The report has the form of an appeal to the general lay reader, though in the discussion of many topics, such, for example, as the subjects of instruction, detailed descriptions of the desirable requirements are given. The tone of the report is not severely critical, though numerous recommendations for enlargement of the schools are made.

#### GREENWICH EXHIBIT

In June, 1912, the Russell Sage Foundation brought to its consummation at Greenwich, Connecticut, an educational survey which is unique in its mode of presentation. The technical details of this survey are nowhere apparent. An educational exhibit was presented to the citizens of that city and a pamphlet of 24 pages was distributed. This pamphlet gives pictures, diagrams, and maps setting forth vividly the needs of improvement. There are pictures and charts which show the respects in which other school systems are superior to those of Greenwich.

#### BRIDGEPORT SURVEY

During February, 1913, Superintendent Van Sickle reported to the Board of Education of Bridgeport, Connecticut, his findings on the schools of that city. The report is printed in a pamphlet of 129 pages. Mr. Van Sickle had the assistance of Dr. Ayres, Dr. H. S. West of Cincinnati, Mr. Gordy, Mr. E. E. Mackary of Springfield, Mr. E. Hebden of Baltimore, and Mr. E. H. Webster of Springfield.

The report consists of (1) Preliminary Comments and Recommendations (6 pages); (2) A Financial Study of the System (19 pages); (3) Dis-

tribution of Pupils (10 pages); (4) The City Normal School (10 pages); (5) The High School (8 pages); (6) The Industries of Bridgeport and Industrial Education (16 pages); (7) Special Subjects: History, English, and a Series of Tests in Arithmetic (47 pages).

The report contains numerous comparative tables. It is based on observations and these tables and presents many technical details. It frankly emphasizes the points in which the schools are found to be defective. The demand for more investment of public funds in the schools is presented in such a way that the lay reader would be able to understand the comparisons. The rest of the report is more in the form of a technical report useful to school officers. The paragraphs on the Industries and Vocational Education are full and emphatic and ought perhaps to be described as popular in form.

#### SECOND BOISE SURVEY

In February, 1913, a commission consisting of Professors Elliott, Judd, and Strayer undertook, at the request of the Board of Education of Boise, Idaho, a second survey of the schools of that city. The report is a pamphlet of 31 pages. The following are the section headings: (1) Scope of Examination (half-page); (2) The Course of Study (2 pages); (3) Supervision (2 pages); (4) The Teaching Staff (2 pages); (5) Classification and Progress of Children through the School System (3 pages); (6) Parks and Playgrounds (1 page); (7) The School Plant (1 page); (8) Expenditures (9 pages); (9) Co-operation of the Community with the Public Schools (2 pages); (10) Report on Instruction as Observed.

The report was based on material accessible in the office of the Superintendent and on observation. There are comparative tables. In tone the report is commendatory, with numerous suggestions for enlargement of the school system. In form the report is intended for the lay reader.

#### NEW YORK SCHOOL INQUIRY

This report consists of three volumes of 820, 829, and 924 pages, respectively. It weighs sixteen pounds and contains the reports of twelve educational experts, five engineers and accountants, and two students of government organizations, together with correspondence, summaries, and recommendations attaching to the reports. The cost of the survey was \$95,139. The report was completed about three years



after the appointment of the Committee of the Board of Estimate and Apportionment, which was in charge of the inquiry.

The history of the inquiry is briefly as follows: Certain investigations of the Russell Sage Foundation and of the Bureau of Municipal Research had stimulated interest in the problems of school expenditure and organization and had raised in the minds of the members of the Board of Estimate and Apportionment doubts as to the efficiency of the existing school organization in New York City. Furthermore, questions had arisen from time to time between the Board of Education and the financial board of the city with regard to jurisdiction over funds. These doubts and questions led the Board of Estimate and Apportionment in 1910 to unfavorable action on the request of the Board of Education for an increase in school funds. At the same time the Board of Estimate and Apportionment appointed a committee to make an inquiry into the organization and operations of the city school system.

This committee, after consultation with a number of educators, secured the services of Professor Hanus, of Harvard, to direct the educational survey. He associated with himself eleven other workers, who took up various aspects of the school operations. Under the immediate supervision of the general Committee and without special relations to Professor Hanus' work, an independent survey of the physical and financial conditions of the schools was undertaken by a staff of engineers and accountants.

It is not appropriate in this brief summary to attempt any account of the contents of the three volumes of the report. The first two volumes are the result of the work of Professor Hanus and his associates in the educational survey. The last volume contains the reports of the financial and physical experts and also the statement of the work that was done by two later appointees, whose report is substituted for the rejected report of one of Professor Hanus' associates.

The history of the publication of the report itself is of some interest. A dispute arose between the Committee of the Board of Estimate and Apportionment and one of Professor Hanus' associates, namely, Professor Moore, of Yale University. Professor Moore had been charged with the responsibility of preparing a report on the administrative aspects of the school organization. He did not answer all of the supplementary questions which were put to him by the Committee, and on this ground the Committee felt justified in refusing to accept and pub-



lish this portion of the report. The original form of the publication of the report was in small pamphlets dealing with the independent contributions of each of the individual members of the educational survey. These independent contributions were prefaced in each case by a portion of Professor Hanus' general report. The bringing together of all Professor Hanus' work was not possible, therefore, until the final three volumes of the report were issued. In the meantime most of the material was reprinted by the World Book Company, and because of the limited number of the official reports printed it is probable that the distribution of the report to students of education will depend chiefly on this outside edition.

It is quite impossible to make any single statement about the bulky reports of the various individual investigators. The reports contain a large number of tables which summarize the studies made by these investigators. They also contain descriptive accounts of observations made in the schools themselves. There is much illustrative material, such as photographs and charts, which supports the statements made by the observers.

The report also contains numerous recommendations which have stimulated discussion throughout the teaching staff of the city of New York and throughout the educational world. These recommendations have frequently been criticized as unfounded. On the other hand, a good deal of objective evidence was presented in each of the reports and it is the contention of the members of the inquiry staff that they made a sufficient investigation of the conditions and reported enough verifiable facts to justify in a scientific way the recommendations made.

Perhaps the most significant result of this inquiry is the establishment in the office of the Superintendent of Schools of New York City of a Bureau of Statistics and Inquiry. The results of the inquiry have also been taken up and extended by several independent organizations, especially the Public Education Association of the City of New York and the Bureau of Municipal Research. Both of these associations have issued publications bearing upon different aspects of the report. Furthermore, the local teachers' associations have devoted much attention in committee and in general session to various aspects of the report.

#### REPORTS OF CARNEGIE FOUNDATION

The Carnegie Foundation has published two notable reports of surveys, one of the medical schools of the United States and one of the

educational system of the state of Vermont. The first appeared in 1910, the second in 1914.

#### SUMMARY OF MEDICAL SCHOOLS

The survey of medical schools was made by Abraham Flexner and consists of 326 pages of text preceded by an introduction by President Pritchett of the Foundation and followed by an index and an appendix giving a statistical summary of the facts regarding all of the schools investigated. In point of method the report presents the results of personal inspection and also a careful digest of a large body of documentary evidence, such as catalogues, reports, special communications, and historical materials.

The report is divided into a general discussion and a detailed report on individual schools arranged by states. The general part of the report opens with a historical account of medical education in the United States and Canada. Then follow summaries of the ideal and actual basis of medical education, of the course of study (74 pages), of the financial aspects of the situation (17 pages), and of such topics as medical sects, medical state boards, education of special classes, such as graduate students, women, negroes.

The report is very pointed in its criticisms of the general situation and of special schools. The reconstruction of medical education which has been going on since the appearance of this report is the strongest evidence of its strength and timeliness.

The survey was undertaken by the Foundation because it was found that the administration of university pensions immediately involved the Foundation in the consideration of the relation of medical schools to universities. Historically and in fact medical schools have only the loosest connection with universities. The agent of the Foundation was not invited by many of the schools, while in others he was welcomed and his work facilitated as fully as possible.

#### VERMONT SURVEY

The survey of Vermont was undertaken at the request of a commission created by action of the state legislature. The legislature had its attention drawn by the governor of the state to the fact that several of the higher institutions of education which were drawing on the state treasury were not co-ordinated in their work and were out of relation to

the public schools. It seemed wise, therefore, to canvass the whole situation with a view to determining the best method of readjusting all of the educational activities. The commission appointed to report to the legislature turned to the Foundation with the request that that institution carry on the investigation.

The report, consisting of 241 pages, sets forth in detail the findings of a group of workers employed by the Foundation. The report is made up of three parts. Part I (16 pages) states briefly how the survey was begun, how it was carried on, and what the investigators recommend. Part II (197 pages) presents in descriptive chapters the observations and findings of the surveyors. Part III (16 pages) presents a statistical summary of the facts discussed in the earlier sections of the report. Part II opens with a description of the state and its educational system. The description takes up in turn the elementary schools, secondary schools, normal schools, vocational schools, and higher institutions. A good deal of space is given to the support of these various school units.

Vermont presents essentially a rural school situation with a few larger communities. The virtue of this report is the large and exhaustive way in which this situation is presented. There is much critical discussion, but the facts seem to be representative and the criticism is directed to constructive recommendations.

The most striking single feature of the report is the recommendation that the state devote its energies and its expenditures to the development of the common schools, even to the extent of withdrawing state aid from the higher institutions which now enjoy some state support.

#### BUREAU OF MUNICIPAL RESEARCH SURVEYS

The Bureau of Municipal Research did not reply to the request of the secretary of the Committee on School Efficiency for copies of the various investigations which have been made by this bureau or its agents. The secretary has had in hand two manuscript reports—one on St. Paul, one on a rural district. These will be briefly outlined. It is also possible to summarize two printed reports issued by the Bureau, namely, the report on Wisconsin Rural Schools and the report on the City of Atlanta. In the course of correspondence incidental reference has been made to reports on Syracuse and Waterbury, but these are not accessible to the secretary. Attention is also drawn to the fact that a continuous series of small leaflets and postcards is distributed by the

Bureau to school superintendents and school officials. On these leaflets and postcards summaries, questions, and criticisms are circulated, especially with reference to the New York inquiry.

#### ST. PAUL SURVEY

The survey of public schools of the city of St. Paul was undertaken at the request of a committee of citizens who defrayed the expenses of the survey. The survey falls into three sections: (1) a section dealing with the financial records of the Board of Education and the disbursement of funds; (2) a section dealing with the organization of the office of the Superintendent; and (3) a section dealing with the organization of instruction in the schools. The first section points out the difficulty of extracting from the present books of the Board of Education any accurate figures with regard to different types of instruction and the cost of different phases of the work of the schools. A series of detailed recommendations for changes in the accounting system was made, most of which could have been covered by the single recommendation that the Board adopt the system of accounting which is recommended by the Bureau of Education. The office of the Superintendent is severely criticized because it is deficient in clerical assistance and because the physical conditions did not seem satisfactory to the surveyor. With regard to instruction, a series of concrete examples is given of poor work in the schools. The report after it was prepared was submitted to the Board of Education and was published in sections in the public press of the city. In tone the report is distinctly critical of the school system. The recommendations that are made are based upon general and in many respects abstract standards of efficiency. This becomes especially clear when one considers the situation with reference to the organization of the Superintendent's office. It is stated, for example, that the Superintendent himself is unable to devote himself to his particular duties because he is in a noisy and public office. The Superintendent calls attention to the fact that he deliberately put himself in this sort of office in order that he might be accessible to the citizens of St. Paul and in order that he might have a direct view of the work of the office. The report is an appeal to the citizens of St. Paul for very radical changes.

#### RURAL DISTRICT SURVEY

A second manuscript report of the Bureau relates to an enterprise which is under consideration by a philanthropic gentleman who intends to start a school in Maryland for a group of orphan boys whom he



intends to adopt. The district which is surveyed in this report is a country district including an area of perhaps ten miles on each side. There are several different schools and small settlements included within this territory.

It is recommended that a new consolidated school replace these schools. In justification of this recommendation a survey of the physical conditions of the existing schools is undertaken and the departure of these schools from the sanitary and architectural standards which ought to be recommended is clearly pointed out. Also examples are given of inefficient instruction. Positive recommendations are made setting forth the standards of construction which should be adopted in the new school; also recommendations of a general type are made with regard to the employment of a higher grade of teachers for the consolidated school. The problem of transportation is discussed at some length. In this discussion of consolidation no reference is made to the laws of Maryland which would have to be considered in bringing about the consolidation and no adequate account is taken of the willingness of the various communities thus to be consolidated. Finally, the physical difficulties of transportation are very lightly treated. The survey is in its tone extremely critical of the existing schools and very optimistic about the advantages of the consolidation. In form it is a recommendation to a single individual and is to be used by the agents of the gentleman to whom it was rendered.

#### WISCONSIN SURVEY

In August, 1912, a preliminary report on the needs and conditions of the rural schools of Wisconsin was published in a pamphlet of 92 pages. This report was given out as a field study reported to the Wisconsin State Board of Public Affairs by members of the Training School for Public Service. It should be noted that this report, which is primarily a school report, is addressed to a board in the state of Wisconsin which is not in charge of the schools of that state. The report contains, first, a summary of the agencies which make for the improvement of rural schools. The second part contains a survey of lax methods of controlling school expenditures. In this section many details are given of bad management in special districts. The third part contains a survey of the sanitary and educational conditions in the rural schools. The fourth part gives an account of defects in county supervision in the districts visited. The fifth part gives an account of the defects in the



general state supervision of these same districts. The sixth part contrasts the state supervision of state training schools and the state supervision of rural schools. The seventh part contains a series of suggestions for administrative and legislative remedies.

In tone the report is radically critical, not only of the rural schools, but also of the state department. It is addressed to the people of the state in the apparent hope of bringing about legislative changes which shall be advantageous. It may be interesting to note in this connection that the county superintendents at their annual meeting immediately following the appearance of this report passed a series of resolutions in which they describe the report as unfair and inadequate. They point out that the material was collected hastily, that it is not typical, that it does not reach all of the important districts in the state, and that it will be harmful to further state legislation rather than helpful to it. The essential matter which may be of interest to the present Committee is that the report was organized and presented under the auspices of a board wholly unrelated to the educational board of the state.

#### ATLANTA SURVEY

The survey of the schools of Atlanta is part of a double survey by the Department of Health and the Department of Education. The report is made to the Chamber of Commerce and appeared in a pamphlet of 44 pages, 24 of which refer to schools. The report on schools deals with the physical conditions, with administrative organization, and with observations or so-called "field observations" made in the schools. There are several tables of retardation and examples of record-sheets which are recommended.

#### OHIO SURVEY

The most comprehensive piece of work which has been done by the Bureau is the Ohio survey, which was carried out under the supervision of Mr. Horace L. Brittain. The report of this survey is a volume of 352 pages. It appeared in 1914. In the appendix (46 pages) are presented in full the "Field Forms and Questionnaires" used in gathering the materials presented in the report. The report is full of very picturesque and concrete materials, photographs, charts which exhibit in striking ways the population of districts and the equipment of schools, and brief, pointed, descriptive paragraphs and recommendations. The report

differs from most survey reports in that it does not aim to present any coherent exhaustive discussions. It is a series of snapshots and racy, "snappy" recommendations.

In the preparation of the report the co-operation of a very large body of workers was secured. Teachers in normal schools and colleges, superintendents, and grade teachers all co-operated to an extent which stimulated the interest of the entire school population of the state. The criticisms were such as to indicate the need of a more general supervisory scheme and the necessity of better training of teachers.

As a result of the survey and the recommendations which were reached, a special session of the legislature enacted a radical revision of the state school laws. The new law provides for supervision and for a redistribution of state funds on the basis of number of teachers and average daily attendance of pupils. There is a minimum wage for teachers, higher training to be required. There is to be a standardization of schools and an admission to higher schools without examination. There is more supervision and a requirement of new subjects in the course of study. There can be no doubt that school reform has gone forward with a rush as a result of the revelations made by the survey.

#### WISCONSIN STATE REPORTS

During the latter part of 1912 two reports were prepared and issued by the Wisconsin State Department of Education on the rural schools of that state. These reports are evidently prepared by the Bureau of Municipal Research by developing a constructive policy looking toward consolidation of schools and more supervision. The state Superintendent secured the co-operation of a committee of citizens. This Committee of Fifteen through a subcommittee has collected much information regarding consolidation of schools in Wisconsin and other states. A general report of 30 pages is issued by the whole Committee and a special report on Consolidation (90 pages in length) is issued from the subcommittee. The report of the whole Committee is very general in its terms. There is one table showing how little supervision is provided and there is general discussion of the needs of improvement in the teaching staff and in the equipment of rural schools. The report on Consolidation is much more concrete. It contains photographs, arguments in favor of consolidation, and facts regarding the success of consolidation in other states.

## NORTH CENTRAL ASSOCIATION SURVEY OF COLLEGES AND UNIVERSITIES

In order to prepare a list of approved colleges and universities for the use of the Association, the colleges and universities of the North Central territory were asked in February, 1913, to fill out elaborate blanks giving full information regarding modes of admission, size of student body, sizes of classes, number of members of faculty, hours of work of the faculty, material equipment, income, and expenditures. On the basis of the returns the secretary of the Commission, which is a branch or Standing Committee of the Association, prepared a series of tables showing the facts with regard to seventy-three approved institutions. These facts are embodied in twenty-three tables with explanatory comments. The report is a pamphlet of 32 pages, issued as *Monograph Supplement No. 4*, of the *School Review*. Subsequent reports of a similar type are promised.

## PORTLAND SURVEY

Late in 1912 the taxpayers of the city of Portland, Oregon, at a regular meeting appropriated funds and appointed a committee for the purpose of surveying their schools. The cost of conducting the system had increased nearly sixfold in a decade, while the population had increased only a little more than twofold. Furthermore, there was a feeling throughout the city that the organization of the schools was not so highly efficient as might be desired.

The Committee secured the services of Professor Cubberley, who associated with himself a number of others, and in August, 1913, a report was rendered. The report is printed in a volume of 317 pages. It is made up of four parts. Part I (68 pages) deals with Organization and Administration; Part II (145 pages) deals with Instructional Needs; Part III (69 pages) deals with Buildings and Health; Part IV (33 pages) deals with Attendance, Records, Costs.

The report is intended for the interested layman as well as for school officers. To this end the general principles of school organization and management are discussed at length. There are numerous tables and charts setting forth the facts on which recommendations are based.

The report is critical of the system, chiefly on the grounds that the Board of Education had taken over too many details of administration and that the instructional staffs had become very slow to exercise initiative and their work had been reduced to a stereotyped formality. The

major part of the report deals with these difficulties. The method of collecting the facts was through observations made by the surveyors and through the material collected in the form of reports and through the office of the Superintendent. The survey must be described as an outside survey and its effect has been to lead to a very radical reorganization of the system.

#### MICHIGAN CO-OPERATIVE SURVEY

An interesting example of a co-operative survey undertaken by a teachers' association is presented in the report issued in 1913 by the Upper Peninsula (Michigan) Educational Association.

The report is a pamphlet of 48 pages and is divided into three parts, one on rural schools (13 pages), one on city graded schools (21 pages), and a third (4 pages) on high schools. The rest of the pamphlet is devoted to introduction and recommendations.

The reports were made by school officers. The number of teachers sending in reports is almost the same for the rural schools as for the city schools, so that comparisons are easily made. In all, 1,412 grade teachers, 24 superintendents, and 7 commissioners reported, representing twelve of the fifteen counties; 702 rural teachers reported, 710 city teachers. Of the rural teachers, 137 are without any training for their work and 172 are normal or college graduates. The cities and towns all demand normal or college graduation as prerequisite for grade teachers' certification.

The average number of pupils per teacher in the city and village schools is 37; the average in the rural schools is considerably less, although there are 37 rural schools with more than 50 pupils. The pupils are a surprising mixture of nationalities, the single town of Ironwood reporting 22 nationalities.

The region is devoted to mining, lumbering, and agriculture; the schools consequently make prominent manual-training and agricultural instruction—16 out of the 24 towns reporting give manual training, 7 give agriculture. Six of the towns have trade schools, taught by instructors who have practiced the trades. Trades taught include carpentering, plumbing, blacksmithing, bricklaying, machine-shop, metal work, and pattern-making; two schools have trade courses for girls in dressmaking. The city schools are giving more manual training, trade work, and agriculture than are the country schools.



The city teachers report that 77 out of the total of 710 are performing experiments in physiology along with their instruction. Ninety-nine of these same teachers report taking geography classes on field trips. In the country 152 teachers are performing experiments in physiology; 151 are taking their classes on field trips in geography.

The influence of such a co-operative research is to draw attention to scientific methods of school inspection and incidentally to stimulate much experimentation of the type noted in the last paragraph.

#### MINNEAPOLIS SURVEY<sup>1</sup>

The Minneapolis Teachers Club published a volume in 1913 entitled *A Vocational Survey of Minneapolis*.

This survey was made by a group of men and women, self-appointed, but representative of a wide range of interests, as follows: the Pillsbury Settlement House, the Board of Education, the Trade and Labor Assembly, the manufacturing interests, the public-school teachers, the State Labor Department, Unity House, the Associated Charities, the University of Minnesota, the Y.M.C.A., the Jewish Charities, and the Voters' League.

The purpose of the survey was to discover what relation, if any, existed between the school training and the subsequent vocational success of children leaving school between the ages of fourteen and sixteen. The method adopted was to get a selected list of 500 names of children who had left school five years prior to the survey; to find these 500 children, if possible; and to make an intensive study of each individual case.

The tentative list originally secured contained 543 names. This list was reduced by 191 names for the following reasons: death of child, 10; removal of family from city, 35; inaccuracy of data as to age or date at which child left school, 140; incomplete information, 6. The remaining 352 names constituted the group of which the study was made.

The various studies related to nationality, school grades, retardation, responsibility for leaving school, social conditions, initial occupations, tenure of positions, and wages.

In conclusion the Committee submitted ten recommendations, all of them related to proposed reorganization or amplification of the school system.

<sup>1</sup> Contributed by Professor F. M. Leavitt.



These recommendations commended the "six-three-and-three" plan, the continuation school, the creation of a department of vocational guidance, improvement of school records, the appointment, as an adjunct to the Board of Education, of an advisory commission, the taking of a school census, and the proposal of new compulsory school legislation.

#### PHILADELPHIA SURVEY<sup>1</sup>

The Public Education Association of Philadelphia made a survey of 13,740 children regularly employed and legally employed, between the ages of fourteen and sixteen. This study was based on the school census of June, 1912, and was made with the co-operation of the Department of Superintendents and the Chief of the Bureau of Compulsory Education.

The study sought to answer two questions: first, as to what kind of industries such children were employed in, and, second, as to what wages they received.

The study states that, while the number of working children studied was only a portion of the total number employed, the presumption is warranted that those studied are typical of the entire group.

The study showed among other things the distribution of child workers by the nativity of their fathers; the proportion of child workers in various industries; the relative distribution of boys and girls in the different occupations. The result of the study of wages is given in seven statistical tables.

The following interesting conclusions were drawn from the study:

1. That the problem of the working child is not an immigrant problem, since over 50 per cent of those reported as at work are of the second generation of American birth.

2. That this is not the problem of the boy alone, since over 49 per cent of the workers are girls.

3. That the vast majority of children who leave school at fourteen to enter industry go into those kinds of employment which offer a large initial wage for simple mechanical processes, but which hold out little or no opportunity for improvement and no competence at maturity.

4. That wages received are so low as to force a parasitic life.

5. That but slight advancement is offered the fifteen-year-old over the fourteen-year-old child worker.

<sup>1</sup> Contributed by Professor F. M. Leavitt.







# THE FOURTEENTH YEARBOOK

OF THE

NATIONAL SOCIETY FOR THE STUDY  
OF EDUCATION

## PART I

MINIMUM ESSENTIALS IN ELEMENTARY-SCHOOL  
SUBJECTS—STANDARDS AND CURRENT PRACTICES

BY

H. B. WILSON, H. W. HOLMES, F. E. THOMPSON, R. G. JONES,  
S. A. COURTIS, W. S. GRAY, F. N. FREEMAN, H. C. PRYOR,  
J. F. HOSIC, W. A. JESSUP, W. C. BAGLEY

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Edited by S. CHESTER PARKER, Secretary

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This Yearbook is the 1915 report of the Committee of the Department of Superintendence of the National Education Association on Economy of Time in Education.

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# TABLE OF CONTENTS

## REPORTS OF INVESTIGATORS CO-OPERATING WITH THE COMMITTEE ON ECONOMY OF TIME OF THE DEPARTMENT OF SUPERINTENDENCE OF THE NATIONAL EDUCATION ASSOCIATION

	PAGE
PREFACE . . . . .	7

### PART I. INTRODUCTION

CHAP.

I. THE MINIMUM ESSENTIALS IN ELEMENTARY-SCHOOL SUBJECTS .	9
H. B. WILSON, Chairman of the Committee and Superintendent of Schools, Topeka, Kansas	

### PART II. GENERAL SURVEY

II. TIME DISTRIBUTIONS BY SUBJECTS AND GRADES IN REPRESENTA- TIVE CITIES . . . . .	21
HENRY W. HOLMES, Assistant Professor of Education, Harvard Uni- versity, Cambridge, Massachusetts	

III. TYPICAL EXPERIMENTS FOR ECONOMIZING TIME IN ELEMENTARY SCHOOLS . . . . .	28
FRANK E. THOMPSON, Professor of Education, University of Colorado, Boulder, Colorado	

### PART III. MINIMUM STANDARDS AND CURRENT PRACTICES IN THE FORMAL SUBJECTS

#### IV. READING

##### *Section 1*

STANDARD VOCABULARY . . . . .	37
ROBINSON G. JONES, Superintendent of Schools, Rockford, Illinois	

##### *Section 2*

STANDARDS IN RATES OF READING . . . . .	44
S. A. COURTIS, Supervisor of Educational Research, Detroit, Michigan	

##### *Section 3*

SELECTED BIBLIOGRAPHY UPON PRACTICAL TESTS OF READING ABILITY . . . . .	59
WILLIAM S. GRAY, Department of Education, University of Chi- cago, Chicago	

CHAP.	PAGE
V. HANDWRITING . . . . .	61
FRANK N. FREEMAN, Assistant Professor of Educational Psychology, University of Chicago, Chicago	
VI. SPELLING . . . . .	78
HUGH CLARK PRYOR, Teachers College, Columbia University, New York City	
VII. THE ESSENTIALS OF COMPOSITION AND GRAMMAR . . . . .	90
JAMES FLEMING HOSIC, Head of the Department of English, Chicago Normal College, Chicago, and Editor of the <i>English Journal</i>	
VIII. CURRENT PRACTICES AND STANDARDS IN ARITHMETIC . . . . .	116
WALTER A. JESSUP, Professor of Education, State University of Iowa, Iowa City, Iowa	
PART IV. MINIMUM STANDARDS AND CURRENT PRACTICES IN THE CONTENT SUBJECTS	
IX. THE DETERMINATION OF MINIMUM ESSENTIALS IN ELEMENTARY GEOGRAPHY AND HISTORY . . . . .	131
W. C. BAGLEY, Professor of Education, University of Illinois, Urbana, Illinois	
X. THE ESSENTIALS OF LITERATURE . . . . .	147
JAMES FLEMING HOSIC, Professor of English, Chicago Normal Col- lege, Chicago, and Editor of the <i>English Journal</i>	
<hr/>	
CONSTITUTION OF THE NATIONAL SOCIETY FOR THE STUDY OF EDUCATION	153
MINUTES OF THE RICHMOND MEETING OF THE NATIONAL SOCIETY FOR THE STUDY OF EDUCATION . . . . .	155
FINANCIAL REPORT OF THE SECRETARY-TREASURER OF THE NATIONAL SOCIETY FOR THE STUDY OF EDUCATION . . . . .	156
LIST OF ACTIVE AND HONORARY MEMBERS OF THE NATIONAL SOCIETY FOR THE STUDY OF EDUCATION . . . . .	158
MEMBERSHIP IN THE NATIONAL SOCIETY FOR THE STUDY OF EDUCATION	163



## PREFACE

This volume continues the policy that has characterized the publication of Yearbooks in recent years by the National Society for the Study of Education, namely, to present discussions that deal directly with the practical problems of readjustment that now confront American educators, and to include descriptions and suggestions that will prove of direct practical value to teachers and administrators in solving these problems in their own schools.

At the meeting of the Department of Superintendence of the National Education Association in Richmond, Virginia, in February, 1914, the Committee on Economy of Time from this organization presented a report and was continued for another year. Members of this committee who were also members of the National Society for the Study of Education, and who were familiar with the policy of the latter organization in publishing Yearbooks *before* the meeting at which they were to be discussed, suggested the possibility of the National Society's publishing the 1915 report of the committee in this way. This plan was adopted and carried out. The present volume is the result.



## PART I

### INTRODUCTION

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### CHAPTER I

#### THE MINIMUM ESSENTIALS IN ELEMENTARY-SCHOOL SUBJECTS

##### REPORT OF THE COMMITTEE ON ECONOMY OF TIME

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This report to the National Department of Superintendence by its committee on Economy of Time in Elementary and Secondary Education, made with the assistance of a number of co-operating investigators, constitutes the fourth large effort within the last two decades by some branch of the National Education Association to examine and improve the curriculum of the public schools. Attention was first directed to the high-school curriculum in the report of the Committee of Ten. The report of the Committee of Fifteen was concerned with the training of teachers and the organization of city schools, but it also gave large attention to the correlation of the studies of the elementary schools. The report of the Committee of Twelve on Rural Schools, in its treatment of instruction and discipline, discussed the course of study, accepting the report of the Committee of Fifteen on the several branches of the course of study.

The present report on the minimum essentials in certain subjects of the elementary curriculum is one result of an effort to develop a program for economizing time in public-school education. The attack on this large problem was begun in the National Council of Education in 1903 under the leadership of President Emeritus James H. Baker.<sup>1</sup> The

<sup>1</sup>The chief initial impetus toward the movement for economizing time in education, probably antedating somewhat the attack on the problem by the National Council, was given by the late President William R. Harper, of the University of Chicago, before a notable gathering at the University in the autumn of 1902, where he read a brief paper proposing a scheme for saving two years of time in the completion of a college course. Participating in this discussion were the late Superintendent Louis Soldan, of St. Louis, and Professor John Dewey. See "Shortening the Years of Elementary Schooling," by John Dewey, *School Review*, II, 17, January, 1903.

most significant result thus far of the work of the Committee from the Council is the report on "Economy of Time in Education," published in 1913 as *Bulletin 38* of the Bureau of Education. Upon the initiative of the Council committee the Department of Superintendence authorized the appointment of a committee of five at the meeting of the Department in Mobile in February, 1911. The earlier efforts of this committee were directed toward arriving at an understanding of the meaning and scope of the problem and in enlisting the co-operation of those who can aid in a fundamental way in its solution.

Preliminary reports defining in outline form the scope of the problem and the possible lines of attack in its solution were made at the meetings of the Department in St. Louis in 1912 and in Philadelphia in 1913. At the meeting of the Department one year ago in Richmond, two typical reports on English and arithmetic were presented as illustrative of the type of studies which the committee had come to believe should be made in all subjects, in the interest of determining the proper content for the subjects of study in the elementary curriculum. The Department responded to the presentation of these reports and to the projected plan for treating all subjects in the elementary curriculum similarly most enthusiastically by recommending that an appropriation sufficient to defray the expenses of such a piece of work be made, and guaranteeing the provision of the same in case the Executive Committee of the National Education Association found it impossible to appropriate the money from funds at its disposal.

While the Department committee was made responsible by a resolution adopted at the meeting of the Department in St. Louis in 1912 for studying possible ways of economizing time both in the elementary and in secondary schools, our attention thus far has been mainly directed, and in this report is wholly directed, to the study of elementary-school problems, reserving until a later time the study of such problems in the secondary field as are vitally related.

In the report referred to above the Council Committee on Economy of Time in Education brought forcibly to the attention of the country the desirability of shortening the period of formal education. The following proposals pertinent to the purposes of the Department Committee on Economy of Time in Education are quoted (see pp. 18 and 19):

1. The contemporary judgment is that the period of general education should be shortened at least two years.

4. In the elementary and secondary period, economy through selection, elimination, vital methods, relation to modern life, would yield much better results and little or nothing would be lost by the proposed change in time.

8. To define the form of discussion, the following divisions of the entire period of general and special education are proposed:

Elementary education.....	6-12
Secondary education (2 divisions—4 years and 2 years).....	12-18
College.....	18-20 or 16-20
University (graduate school and professional schools).....	20-24

Preceding their statement of conclusions, the committee said:

When by economy—this does not mean more cramming, but less—as much can be accomplished in the elementary and secondary schools and in the first two years of college as is now done in the full sixteen years, the last two years of college can count toward graduate and professional degrees and two years in the whole period can be saved.

Upon the general thesis that the period of formal education should be shortened there appears to be fairly general agreement. Where and how this shortening is to take place is, however, not so generally agreed upon. The committee of the Council believes that the greatest waste in education is in the elementary schools and has recommended that the period of elementary education be reduced to six years, maintaining that the essential knowledge, habits, ideals, and attitudes for individual and social needs can be and should be acquired in that time. This attitude on the part of the Council was evidenced in the resolution proposed by Professor Suzzallo of the committee of the Council in closing his address before the meeting of the Department of Superintendence at Mobile, as follows:

The main requirement at this point in our progress is to investigate the waste in the elementary schools and to make definite proposals for eliminating the archaic and least useful materials of the course of study and to propose more economic methods of teaching. To this end I move that the Department of Superintendence appoint a committee of five on Economy of Time in Elementary Education, this committee of five to co-operate with the general Committee on Economy of Time in Education.

The same attitude is further indicated in the following quotations from the report of the Council:

We approach now the question of saving time in the elementary period or of accomplishing more within the time. . . . The committee agrees that there is much waste in elementary education and that the elementary period should



be from six to twelve. Nearly all our correspondents are emphatic regarding waste and the importance of shortening the entire period of general education. Saving of time can be made in the following ways:

1. The principle of selection is, first: Choose the most important subjects and the most important topics; make a distinction between first-rate facts and principles and tenth-rate; prune thoroughly, stick to the elements of a subject; do not try to teach everything that is good; confine the period of elementary education to mastering the tools of education. This does not prevent inspirational work, which is a demand on the skill of the teacher rather than on time. A great secret of education is to accomplish a maximum of training with a minimum of material. This is especially true of formal subjects; it is true also of inspirational subjects, in that after a general survey of the field emphasis should be placed upon a few selected points. Under the conditions above enumerated the formal elementary period can end in six years.

The committee of the National Department of Superintendence is not yet committed to the thesis that it is necessary or desirable to shorten the period of elementary education. It does, however, agree with the Council committee that there is great waste in elementary education and that either the period should be shortened or that more should be accomplished in the time allotted, or both. Economy of time in elementary education may mean either a shortening of the period of formal education or the more economical use of the time required, whatever it may be, in order that the maximum accomplishment in knowledge and skill may result. It is the latter conception of educational economy that is the more fundamental. The significant problem, then, is not what can be done to accomplish in six years what now requires eight years, but what can be done in the elementary schools of our democracy to secure that degree of accomplishment in knowledge, character, and skill essential to equip those who finish the elementary schools with an intense desire and the training necessary to make the greatest possible additional personal growth and with the disposition and ability to contribute to the welfare of society. Society is still depending primarily upon the elementary schools to furnish not only the tools of knowledge but also those facts, concepts, and principles essential in a democracy to common discussion and to the collective consideration of common problems. The training of the elementary schools must supply the requisite basis for "mutual intercourse, mutual understanding, and mutual sympathy," which are absolutely essential to a successful democracy. It is from the point of view of insuring that the schools supply this common basis for conference and

intercourse that the determination of the indispensable content for each subject of study is of paramount significance. We must determine what the absolute essentials are in the equipment of our citizenship that they may discuss and confer on a sufficiently high level to insure the progressive evolution of our democratic society. By concentrating our teaching efforts upon these essentials, their thorough teaching and permanent fixation will be insured in the minimum time.

Our first objective, therefore, is not merely time gain. If gain is accomplished, it must issue because the efficiency can be secured in less time. Saving of time is undoubtedly desirable if it can be secured without sacrificing efficiency. The saving of time will not only result in less cost to the taxpayers for the maintenance of the public schools but it will likewise result in increasing the earning power of those who graduate from these schools, owing to their earlier entrance into remunerative occupations.

Economy in time under either conception may be attained (1) by the elimination of nonessential subjects or subject-matter and by including only such additional significant material as is clearly vital in realizing the ends of elementary education; (2) by the improvement in methods of teaching and learning; (3) by the organization of the whole school system and the course of study so that each part may be taken at the optimal time in the child's development. In view of the objectives in appointing the committee from the Department of Superintendence, attention is first devoted to (1) in this report. For logical reasons also (1) should be treated first.

The ideally constructed course of study for the elementary schools in the interest of providing adequate general education is one stripped of all content not essential to the needs of modern life and organized so as to harmonize with the child's growth in capacity and experience. Its presentation with due regard to the most efficient methods of teaching and learning must be assumed, of course, if it is to secure the largest possible results. With reference to this task Professor Dewey says the problem is "the selection of the kind, variety, and due proportion of subjects answering most definitely to the dominant needs and powers of presentation that will cause the selected material to enter vitally into growth."<sup>1</sup> Again he says: "The selection and grading of material in the course of study must be done with reference to the proper

<sup>1</sup> See Dewey "The Psychology of the Elementary Curriculum" in *The School and the Child*.

nutrition of the dominant directions of activity in a given period. The difficulty is in seeing just what materials and methods, in what proportion and arrangement, are available and helpful at a given time."<sup>1</sup>

Before the question can be convincingly answered whether the period of elementary education can be shortened, it would seem necessary to determine the minimum standard curriculum selected and organized to meet fully the general aims or purposes of elementary education, specifying a minimum essential content for each subject of this standard curriculum. Whether the aims of the elementary school can be satisfactorily realized in six years or not, or in what time they can be realized, can be discovered only after such a determination has been made. In other words, we must work out a minimum content for each subject of study, holding in mind those standards of attainment which good teaching should seek to approximate. With this tentatively accomplished, we shall have a basis for determining the standard time required for executing such a course of study.

Whatever time may ultimately prove to be necessary, the fundamental questions are: (1) What subjects are essential constituents of the elementary curriculum? (2) What is the absolutely essential content in each subject? It is the second question on which the Department committee and the co-operating investigators have been working during the past year. The results of these investigations follow in this *Yearbook*. It is perhaps unnecessary to point out what a careful reading will render evident, that in the time available it was impossible to make the reports more than partial and tentative. Not only do the results submitted need the testing of use and criticism, but much more work remains to be done.

The formulation of a minimum essential content for any school subject is a complex problem and is beset with theoretical and practical difficulties. Various methods of procedure may be adopted: (1) An examination may be made of representative curricula the country over to determine the consensus of experience and practice as to the topics to be included, time to be allotted, etc. (2) Subject-matter to be included and time allotments may be determined on the basis of judgments of superintendents, principals, teachers, subject-matter experts, and students of education. (3) An examination may be made of progressive experiments designed to secure economy in time either by elimination

<sup>1</sup> *Op. cit.*

or by improvements in methods and organization. (4) Each part or each subject may be subjected to some more fundamental educational criteria or tests of inclusion, emphasis, or exclusion. Until there are definitely established and accepted standards of attainment based on individual capacities and social needs, the determination of minimum essentials by any method is a difficult problem.

Is it possible to arrive at a definition of the function of the elementary school which will be generally accepted? And more especially, is it possible to derive from such a definition acceptable fundamental principles which may guide in determining the minimum essentials in school subjects? Apparently our leaders in education agree that the function of the elementary school is to provide those educational opportunities necessary to insure, with the assistance of the other institutions of society, the acquisition on the part of elementary-school children of those habits, skills, knowledges, ideals, and prejudices which must be made the common property of all, that each may be an efficient member of a progressive democratic society, possessing the power of self-support and self-direction, the capacity and disposition for co-operative effort, and, if possible, the ability to direct others in positions of responsibility requiring administrative capacity.

The selection of subject-matter for any given period must be made with reference to the capacities and interests of children at this period and with reference to common social needs. Ultimately, the content and emphasis in each subject of study is determined by society's judgment in reference to its needs, while the organization of this content and the methods which shall be employed in teaching children are determined by the nature, ability, and interests of the children to be taught.

Two general principles of inclusion of subject-matter may therefore be formulated thus: (1) Whatever is included in any subject for any age must be reasonably comprehensible by children of that age. (2) Whatever is included must minister to the social needs common to ordinary American children. Corresponding principles of elimination may be formulated thus: (1) Subject-matter too difficult for the majority of normal children without undue expenditure of time and energy must be excluded. (2) Subject-matter that is not essential for at least the majority of children must be excluded. The fixing of minimum essentials upon any other basis than the abilities and social needs of the majority of children leads at once into difficulties. A curriculum or a content



for any subject based on the ability and needs common to all normal children gives an impossibly low standard. One based on the capacities and needs of 75 per cent of children is likewise too low to be useful. On the other hand, a minimum standard which is adjusted to the capacities of but 50 per cent of children is a misnomer.

The only escape from the dilemma is a graduated series of essentials progressing from the skills and abilities necessary for all normal children up through those that are desirable for all normal children, if they can be attained. The great variability in individual capacities and the possibly equally great variability in individual needs for effective social adjustment make any other basis of selection impossible.

If it is impossible to discover from educational theory fundamental tests for exclusion or inclusion, we are driven to the method of determining minimum essentials on the basis of the best current practices and experimentation which give satisfactory results. Those results are satisfactory which meet adequately the common needs of life in society. This in the main is the method employed in the investigations upon which the following reports in the *Yearbook* are based.

Following the introduction, Part I, the report consists of three parts. In the general survey, constituting Part II, Professor Henry W. Holmes reports a study of the time distribution by subjects and grades in 50 representative cities selected at random, which was made as a means of determining the current practice in reference to the grade in which the various subjects of the elementary schools are taught and to the time which is devoted to their teaching. His conclusions are summarized on p. 21 *infra*. Following this, Professor Frank E. Thompson has characterized the types to which experiments in economizing time in the country at large can be reduced. He holds, on the evidence of reports from progressive educators in all parts of the country, that there is a strong movement for educational efficiency, but that the movement is essentially for rearrangement and new emphases: very few would reduce the total time.

Parts III and IV of the report are devoted to such studies in the subjects of reading, writing, spelling, composition, and grammar, history, geography, and literature as were possible and necessary to enable those in charge of the studies to make a tentative formulation of the minimum requirements in each of the subjects. Part III deals with the formal subjects. Part IV presents reports regarding the essentials in the content subjects of history, geography, and literature.



Three reports are presented touching the formal aspects of oral and silent reading. The determination of the minimum essentials in reading involves two problems: (1) the determination of standard vocabularies, and (2) the determination of standard rates of reading. Superintendent Jones discusses the first of these, setting forth the procedure employed in determining standard vocabularies and in applying the same in testing the reading ability of pupils. Mr. Courtis' report deals with the determination and application of standard rates in reading. He sets forth the elements entering into skill in reading and defines the degrees of skill that are produced at each grade by present training, thus establishing the basis for indicating quantitatively the minimum reading ability in amount and degree of assimilation which should be attained in each grade. The practical advantage of objective standards in reading to classroom teachers and administrators is concretely set forth, and the procedure contended for in reading is supported by stating briefly the objective standards which have been developed in writing, composition, arithmetic, and spelling. To these reports has been added a selected bibliography, prepared by Mr. Gray, with a brief characterization of each reference.

The standard for quality and speed in writing which should be required in grades two to eight inclusive was derived by Professor Freeman upon the basis of the returns (1) in a writing test from fifty-six cities of the United States having a population of 30,000 or over, and (2) in a questionnaire sent to various employers of clerical workers in Chicago. The questionnaire sought information regarding the degree of excellence in writing which employers require of applicants for positions. This information was of value in determining the standard of attainment in writing which pupils should reach by the end of the elementary schools. The report also makes valuable tentative suggestions in reference to the time which is necessary per day in each grade for attaining the standards proposed.

Mr. Pryor's report on spelling discusses both the minimum content and the minimum time. He reviews briefly the word lists developed by Ayres, Jones, and others and concludes that from 750 to 1,000 words (no list is offered) are sufficient in the spelling course for the elementary schools. It is suggested from rather limited data that the tendency is to reduce the time formerly devoted to spelling and that this reduction is made possible by improved methods of teaching. The use of such scales as those developed by Buckingham and Ayres in determining word

lists, spelling efficiency, and requisite time for spelling is briefly indicated. A carefully selected bibliography concludes the report.

In his discussion of language and grammar, Professor Hosis has reviewed very thoroughly all experiments and investigations in English which are germane to his problem. The various scales available for measuring the worth of English composition are carefully evaluated and the studies of basic importance in determining the content of technical instruction in English are reviewed for their contribution to the task in hand. The standards in English proposed before the Secondary Department of the National Education Association in 1908 and before the Commission on the Reorganization of Secondary Education in 1914 are considered as to their bearing on the present undertaking. Professor Hosis finds the time devoted to language in the elementary schools cannot likely be cut down with safety. He urges the need for more definite standards of omission and inclusion, the better organization and teaching of the content retained, the establishment of more definite goals of achievement, and the development of more adequate and practical scales for the measurement of the results of English work. The report closes with a very complete and carefully analyzed bibliography.

Arithmetic is the last subject discussed in Part III. Professor Jessup's recommendations are not only based upon a careful review and consideration of all other relevant studies and investigations but also upon the return showing the practice in the content of arithmetic in 867 cities having a population of 4,000 or over and in 114 counties of the United States. The following topics are treated statistically from the data secured: (1) the elimination of topics; (2) increased emphasis on topics; (3) the recitation-time distribution; (4) the percentage of drill; (5) grade textbook introduction; (6) grade emphasis on topics. A definite standard for attainment in the fundamentals is proposed for each grade, and in conclusion a reduction in the time devoted to arithmetic is recommended.

In Part IV, Professor W. C. Bagley describes three methods which have been employed under his guidance for determining the content in geography and history which it is most important to teach and reports tentatively the results derived from the application of each method. Use of the "newspaper-magazine" method developed suggestive data for both geography and history. The methods of determining minima

by taking the "judgments of specialists" and by "a comparison of school texts" were employed with significant results in history. The tentative results are valuable as guides in the determination of the minimum essentials in geography and history and in indicating the proper emphasis in teaching these essentials.

Professor Hosic treats literature and his contribution will be found on p. 147.

Even a general study of the following report will render it evident that the task of formulating completely the minimum essentials in the subjects treated has not been finished. As much has been accomplished, perhaps, as it was reasonable to expect in the time available to those making the reports. In the present state of our knowledge of social and educational values it is not possible to complete the task with any mathematical certainty that the results offered would meet the educational needs even in a single community. The undertaking is increasingly difficult when the formulation offered is intended to serve as a guide in course of study-making for the elementary schools of the whole United States. Further time and more extended opportunity for conference and experimentation would render it possible to be more specific as to details. The report on language and grammar, history and geography, call particular attention to this. Nothing like the degree of completeness secured in these reports would have been possible but for the existence of the investigators who co-operated with the committee, taking complete charge of the reports as they appear below.

The omission from treatment in this report of the subjects of music, drawing, sewing, cooking, manual training, other forms of handwork, and nature-study, or elementary science, must not be interpreted either to mean that their content is not in need of critical evaluation or that their importance in the curriculum is undervalued. Rather, it was found impossible to add them to the subjects considered and to bring all the matter which this would render necessary to treat within the limits it seemed reasonable to set for this report.

Even if the problem attempted in this report had been more adequately done, only a fair beginning would have been made in the undertaking to accomplish all of the economies which are both possible and desirable in elementary-school education. Further work in this field with the view of completing it for the time being may yet be secured if it seems desirable. There will still remain, however, the problem of

improving the organization of the system and the technique of classroom teaching, that the minimum essentials in the curriculum may exercise the maximum of educational effect with the greatest possible economy of time and effort.

(Signed) H. B. WILSON, *Chairman*

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PART II  
GENERAL SURVEY

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CHAPTER II  
TIME DISTRIBUTIONS BY SUBJECTS AND GRADES IN  
REPRESENTATIVE CITIES

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AND

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I

This report deals with the distribution of time by subjects and grades in the elementary schools of fifty<sup>1</sup> American cities, representing all sections of the country and a wide variety of conditions. The outstanding fact of the report is the great divergence in the allotments—there is still marked disagreement as to the distribution of time (and hence of attention and energy) among the elementary-school subjects. Such

<sup>1</sup> Baltimore, Md.; Berkeley, Cal.; Boise, Idaho; Boston, Mass.; Boulder, Colo.; Cheyenne, Wyo.; Cincinnati, Ohio; Detroit, Mich.; East Orange, N.J.; Fargo, N.D.; Frankfort, Ind.; Freeport, Ill.; Haverford, Pa.; Indianapolis, Ind.; Kansas City, Kan.; Lexington, Ky.; Lincoln, Neb.; Louisville, Ky.; Madison, Wis.; Manchester, N.H.; Milwaukee, Wis.; Minneapolis, Minn.; Montclair, N.J.; Montpelier, Vt.; Mt. Vernon, N.Y.; Nashville, Tenn.; Newark, N.J.; New Haven, Conn.; New Orleans, La.; Newton, Mass.; Omaha, Neb.; Passaic, N.J.; Philadelphia, Pa.; Phoenix, Ark.; Providence, R.I.; Rochester, N.Y.; Sacramento, Cal.; Salt Lake City, Utah; San Francisco, Cal.; Seattle, Wash.; Sioux Falls, S.D.; Solvay, N.Y.; Southington, Conn.; St. Louis, Mo.; Spokane, Wash.; Tacoma, Wash.; Topeka, Kan.; Washington, D.C.; Westerly, R.I.; Wheeling, W.Va. Other cities responded, but in some cases the data came too late and in others we could not use them. We found it necessary, for instance, to deal only with eight-grade systems.



disagreement is doubtless in part irremediable—in so far, for example, as it is due to legitimate differences in the length of the school course or of the school year, or to legitimate differences in public demand, or to fundamental differences in school populations. But in part it is caused by differences of opinion as to points on which opinion may gradually give way to knowledge; as, for example, the subjects to be commonly taught, their relative social values, their essential content, reasonable standards of accomplishment, the amount of time needed to reach such standards, and the most effective methods. Until we can decide such points our tables of time allotments are but guesses, and an average of allotments but an average guess. A statistical standard, however, is better than none, since it shows at any rate the trend of opinion and practice.<sup>1</sup>

## II

Official tables of time allotments do not, of course, represent actual distributions of time. Teachers depart from the schedule for various reasons, good or bad, and there are many interruptions in the work of the school year. No child gets just the number of hours of classwork in arithmetic, or any other subject, which the published school schedule promises him. Eventually our standards must be based on the study of time actually consumed; but even then we shall have to allow for obstacles and interruptions, and meanwhile the assigned times show at least the official prescriptions from which actual times differ. They give us starting-points.

In studying official allotments, however, difficulties arise from differences in the use and meaning of terms. Our definitions of subjects are not settled: topics included under language in one city may be included under composition or grammar in another; nature-study may include elementary science or be included with it or be linked with geography; the assignment for phonics may be separate from that for reading or included in it. Such differences point to the need of accepted definitions and authoritative recommendations on the distinctions between subjects.

<sup>1</sup> The only two treatments of exactly this subject which our subcommittee on bibliography was able to find were Payne's *Elementary School Curricula* (Silver, Burdett & Co., 1895) and Elson and Bachman's article in the March, 1910, number of the *Elementary School Teacher*. The Seminary plans to make a subsequent and more complete study for the sake of comparing present time allotments with those tabulated by Payne. We hope also to make comparisons of cities by groups.

In advance of all experimental determination of minimum essentials or of standard accomplishment our elementary-school practice would profit by careful analysis of the program for delimitation of fields. Interest in correlation and in the motivation of learning has kept us from distinguishing our aims with that clarity and perspective which are necessary for the most effective organization of our work. We cannot advance by avoiding distinctions. To vitalize and socialize elementary-school work we need, not less organization, but more careful organization, with clearer differentiation of subjects through more penetrating analysis of aims.

This is by no means to deny that the clearest definition of subjects would still leave us far from solving the problem of time allotments. We should still have to establish the scope of each subject. If we know what arithmetic and history mean, we do not yet know what topics each should include. At this problem school officers and teachers are continually at work, and our present effort to define minimum essentials by experiment and investigation is an essential step toward its final solution. We cannot tell how much time ought to be given to arithmetic until we know how much arithmetic is to be taught; nor indeed even then, for we must next determine how much time is necessary to reach a defined standard of achievement. This is the chief reason why a study of time allotments can be only an outpost skirmish in the fight for economy of time in elementary education.

In this report we have had to ignore fundamental differences in definitions of subjects and in their content. Choosing a set of terms generally in use, we have set down the times assigned under the chosen headings, interpreting unusual terms by reference to the courses of study which accompanied the schedules. If in a given schedule allotments were made under headings not included under our definitions, we left them out. Our percentages were reckoned on the total time given in all the schedules to certain subjects included in our list. In many cases we wrote for an estimated division of time between allotments separate on our list but combined in the schedule sent to us (e.g., physical training and recesses).

We have used an eight-grade scheme for our calculations. In the case of half-yearly-promotion systems we combined assignments for the two halves of each year to get the total for that year.

## III

The headings under which we classified allotments were as follows:

1. Opening exercises, including allotments in ethics, etc.
2. Reading, including phonics, literature, dramatics, story-telling, memorization of poems, etc.
3. Language, including composition, grammar, punctuation, pronunciation, word-study, etc.
4. Spelling.
5. Penmanship.
6. Arithmetic, including algebra, geometry, business arithmetic.
7. Geography, including physical and commercial geography.
8. History, including civics.
9. Science, including nature-study, elementary science, physiology, and hygiene.
10. Drawing, including picture-study, art, etc.
11. Manual training, including industrial training, handwork, etc.
12. Physical training, including athletics, gymnastics, folk-dancing.
13. Recess.
14. Miscellaneous, including unassigned time, study.

We do not recommend these headings. We used them because we found them convenient. We plan to study the differences in content under all the headings given in the fifty cities and in others and to publish a subsequent report dealing with the headings under which allotments are made and the topics covered by courses of study.

Table I gives the total time assigned to each subject. "Total time" means the number of hours devoted to the subject in all grades. In order to get this figure we often had to multiply minutes per week by the number of weeks of school in the city in question, and reduce to hours. The total time for the whole course and for the year seemed to us the significant figures for this particular investigation. Any child progressing, without repetition of a grade and without "skipping," through all the grades in a given city would spend the number of hours on a given subject which we have called the total time for that subject in that city. The table gives the number of cities allotting time to each subject, the average total time for all the cities in which allotments to that subject were made, the lowest total time in any city, the highest, and the average deviation. It gives also the average *percentage* of time devoted to each of the "recitation-subjects" (opening exercises, physical training,

TABLE I

	Opening Exercises	Reading	Language	Spelling	Pennan-ship	Arithmetic	Geography	History	Science	Drawing	Music	Manual Training	Physical Training	Recess	Miscellaneous
Number of cities allotting time in any grade.....	45	50	50	50	49	50	50	50	47	48	49	46	46	40	28
Average total time*.....	269	1311	849	454	362	981	474	360	279	410	366	316	343	565	397
Lowest total time allotted in any city.....	116	675	119	216	244	456	202	140	54	242	135	76	40	240	39
Highest total time allotted in any city.....	487	2900	1267	774	533	1380	750	700	593	760	600	965	918	933	2018
Average deviation (in hours)*.....	71	309	163	115	62	175	103	75	106	72	58	132	120	133	237
Percentage of average total recitation time†.....	.....	26.3	13.8	7.4	5.9	15.9	7.7	5.8	4.5	6.7	5.9	5.1	.....	.....	.....

\* Only cities allotting time considered.

† Reckoned on the sum of the averages for the indicated subjects.

recesses, and miscellaneous being omitted), reckoned on the sum of the average total times for the recitation subjects in cities which publish allotments for those subjects.

This table shows, therefore, how generally allotments are published for each subject in our list; how near the cities are to agreement as to the time needed for each subject (admitting the lack of agreement as to what shall be attempted in each); and the general trend as to division of time among the subjects.

Table II is a grade table. It shows the average total time for each subject in each grade; that is, the number of hours spent on that subject in each grade (on the average) in the cities in which allotments for that subject in that grade are given. This figure we have called the "average grade time." Where we found such a record as "Nature-study included under reading in Grades I, II, and III," we gave the whole allotment to reading, under which it was published. The table also shows the number of cities giving allotments to any given subject in any given grade. It shows the percentage of time devoted to the several "recitation" subjects in each grade, reckoned on the sum of the average grade times for the "recitation" subjects in that grade. It shows also the lowest allotment in each subject in each grade and the highest.

From Table II a roughly accurate table of average allotments in minutes per week may be derived by dividing the average grade times by 38.75, the average number of weeks in which schools in these fifty cities are in operation, and reducing to minutes.

The following conclusions concerning contemporary school practice seem to us to be supported by the facts given in the tables:

1. The school arts still have the lion's share of attention. Reading, language, spelling, penmanship, and arithmetic—five subjects out of eleven in the "recitation" group—take about 70 per cent of the time spent in strictly class work. These subjects, with history and geography, take over 82 per cent of the "recitation" time. All the cities allot time to all these subjects except penmanship, which is "incidental" in one schedule. No other group shows similar agreement. But the average deviations are larger in reading, language, and arithmetic than in any other subject except "miscellaneous." In reading, the extreme variation is noticeably large, over two thousand hours—more than two years of school life. We need standardization most in the standard subjects.



2. Both music and drawing have a fuller share of educational confidence than science or manual training or physical training. Each has a larger total time allotment, a larger percentage of recitation time, and fuller agreement in assignment of time, both as to the number of cities allotting hours and as to deviation of allotments.

3. In manual training and physical training the extreme deviations and the average deviations are very large, but not so large as in reading and arithmetic. There is less agreement as to allotment for these subjects, however, than for any others except opening exercises, recess, and "miscellaneous."

4. Recess takes more time than any subject except reading and arithmetic. This fact brings to mind a whole series of problems in the hygiene of the program and the management of organized play.

5. The large deviations for "miscellaneous" show how far we are from agreement on study hours, individual work with pupils, self-organized group work, and in general the use of free time, and hence of freedom by both teachers and pupils.

6. There is little agreement as to the grade and the allotment for the beginnings of any of the "accepted" subjects except reading: most of the cities, but not all, start language, spelling, penmanship, and arithmetic in Grade I. There is practical agreement to start them all in Grade II, although spelling and language do not get a unanimous vote till Grade III. Geography waits for agreement till Grade IV; for unanimity, till Grade V. History is not taught by all the cities till Grade VIII.

## CHAPTER III

### TYPICAL EXPERIMENTS FOR ECONOMIZING TIME IN ELEMENTARY SCHOOLS

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#### I

When the topic for this paper was assigned it was the intention of the committee as well as of the writer to bring and have brought together accounts of at least a fair part of all the things that are being done in the country in school affairs to the end of economizing time. It was further intended to make careful examination of all of these things and to reduce them if possible to types, describing under each type all specific instances that could be discovered. Two limitations, at least, have made so ambitious a program impossible: the one a limitation of time, the other a limitation of space. It would require as much space for such a presentation as a full *Yearbook*, and it would require some months to put the thing together, in presentable form, with due justice to each and every instance. That there is so much material has been, and is, one of the chief surprises of the investigation. It can be said without exaggeration that, consciously or unconsciously, and most frequently consciously, educators in every part of the country are doing things and planning things which will eventuate in more economical procedures and larger results.

The paper which it was planned to publish will be published in some form shortly, perhaps as "A Survey of Hopeful Progressive Tendencies in American Education." There is ample material, and excellent material too, for a chapter or even a book on this subject. This paper, however, must be limited to some general observations on the economizing of time and a brief but, it is hoped, a faithful characterization of the types to which the various experiments are readily reduced. In the first place, let it be said that all of the persons who are experimenting, and the hundred or so who have taken the trouble, often a great deal of

trouble, to respond to inquiries, are apparently impressed deeply with the belief that so far the possibilities of our education have not been anywhere near realized. Furthermore, and this is an exceedingly healthful condition, they believe pretty generally that it is not one little thing nor even some one considerable thing that is needed to make the system yield these larger results. A surprising proportion of those who have answered—easily 75 per cent—indicate more or less explicitly their conviction that all of our educational procedure will need to be examined and later adjusted, one part to another and every part to every other part, before it will produce results commensurate with its possibility. The same persons seem confident that such readjustment is entirely feasible, is even already well begun. Not many have indicated very much interest in the shortening of the period of education, but almost everyone, explicitly or by implication, would have much more accomplished within this period. The impression would seem to be that our aims for education are not far from right, that our materials, generally speaking, are not badly suited, and, with a few exceptions, that the period in which our work is to be done is about right, but that so far we have not begun to arrange these materials nor emphasize activities to the attainment of aims within the time allowed to anything like their possibilities. Fully nine-tenths of the experiments and suggestions reduce to attempts at better sequence of subject-matter, better correlation with the pupil's ability or with other subjects, more industry on the part of the pupil, more effective assistance by the teacher, and other things of the same general sort. Educators are trying to save time, not to the end of having more time for something else than education, but to the end of having more in it of education; in general, "economy of time" is but a synonym for "efficiency."

Despite the fact that the problem is not anywhere regarded as simple and that practically no one has a panacea to propose, the experiments under way, or suggested, readily reduce to comparatively few types. The experiments of each type all, or practically all, aim to do what was just suggested, namely, to make more of the possibilities inherent in materials, pupils, and teachers in the present time allotment. Apparent exceptions, such, for example, as shortening the elementary course of study one or two years, show on examination that the advocate contemplates for the pupil a longer course in school either in some trade or technical school, somewhere about the high-school age, or in professional,

cultural, or research activities at the graduate level. Almost no one indicates a wish to get the student completely out of school at an earlier age. Some would get the pupil in touch with life's activities earlier, but practically all would accomplish this either by bringing such activities more actually into the school or by taking the school (or its students) more into the midst of such activities. Again, no one seems anxious to terminate the child's connection with the schools at an earlier period. Though some of the types enumerated and some of the instances specified under the types which follow may not at first reveal their pertinence to the economizing of time, the instances have all been adduced as attempts at that end, many of them, of course, in the better-use-of-time sense.

## II

### BRIEF CHARACTERIZATION OF TYPES DISCOVERED

1. *Regroupings of the school years.*—The experiments under this type are numerous and include such regroupings as are commonly known as the six-six plan, the six-three-three plan, the seven-one-four plan, the six-two-four plan, the seven-five plan, and the seven-two-three plan. Closely associated with these in several instances are plans for the elimination of the eighth grade, but, on examination, in most instances there is no true elimination of the eighth-grade work. Some of it is usually found to be crowded down into the lower grades and some of it has been pushed ahead into the higher grades. Where, by this regrouping, "elementary" education is shortened, the purposes and probably the effects are the clearing of the course to some extent of nonessentials; the bringing of goals (such as graduation, the conclusion of a certain course of study, admission into a different kind of school, etc.) closer; getting pupils into intermediate or high-school work earlier; "speeding up"; keeping pupils in school longer; securing better correspondence of certain types of work with "epochs" in the child's life; dividing the work into more reasonable instalments; and providing better shunting-points that pupils may, to better advantage, change from one course or type of school to another parallel with it. According to testimony, these plans all work well, and inasmuch as the differences between them are not so great after all, especially at what may be regarded as the crucial point—the seventh and eighth grade—we may predict that some one of them, probably the six-three-three plan, will soon take a decided lead over the others and the present eight-four plan.



2. *Modifications of grading and promotion schemes.*—A great many schools are trying out grading and promotion schemes, in general by making more subdivisions of the year grade, such as half-year grades; term grades (usually twelve weeks); quarter-year grades; and no grades at all, that is, ungraded sections; "quick" and "slow" sections. Promotions, in most instances, are possible at any and all of these grade divisions; and over and above that, in some instances, by subjects, on the basis of special examinations; and for work carried "with honor." The purposes specified are: bringing goals closer; spurring the pupil to his best by competition with his own record, with the records of his school and of other schools, and with his fellows; making it possible for each pupil to find the pace best suited to his health, ambitions, or peculiarities; making possible a change of pace, without serious inconvenience, on occasion or necessity. Enthusiastic reports of good results are the rule in connection with this type of experiment, and there can be little doubt that much has been done and will be done in these ways to accommodate the individual pupil and to bring into education more effectively one of the greatest factors in any improved efficiency scheme—competition.

3. *Rearrangements and eliminations of subject-matter.*—These experiments might almost be classed as of two different types—rearrangements and eliminations—were it not for two facts which examination of them reveals: that the two are always complicated in any specific instance and that as a rule there is no real elimination, but rather minimization, transference, or substitution; for example, a topic may drop out of arithmetic but reappear, in modified form, in geography. It is difficult to characterize the experimentation of this type for the reason that it is going on in all of the subjects and in all of the grades. Perhaps the most salient thing to be noted is that a challenge of its right to its place and emphasis is being put to every subject and topic. Another salient characteristic is a search after logical and psychological sequence, correlation, and subordination. The aims most frequently specified are: to relieve the pupils of dead and uninteresting occupation; to employ them with things of which they can see the importance; to avoid cluttering their minds with bric-à-brac of curious and antique sort; to compensate for paucity of detail by clarity of outline; to secure the study of subjects at more favorable periods of the pupil's development; by correlation and concentration to "kill two birds with one stone."



4. *Extra-time and emphasis schemes.*—Extra time is provided for in after-school classes, special classes, evening schools, summer schools, and by ingenious adjustments in some instances which permit the pupil to emphasize his more difficult subjects in time taken from easier ones. The purposes of these experiments are variously specified as: giving the pupil a chance to keep up by means of extra work instead of falling behind; to get ahead in time or power if he choose; to maintain during interschool periods (for example, in the summer) a hard-earned momentum; to keep pupils in the spirit of school work; to save time that otherwise would have to be given to the warming-up process. Some of the most hopeful reports of progress have been given in connection with these innovations. In some places the whole spirit of schools and community would seem to have been changed. Comparison with European school systems, especially those of Germany, France, and Switzerland, tends to force upon us the conviction that so far we have not made enough of our schools in a time way, that is, they do not take up enough of our time, are not in our lives enough; modern industrial conditions no longer very generally justify numerous and long vacations. We are realizing more and more that education is not an incident of life, but, instead, a very large part of it. More than that, we are beginning to realize, when we think in world-terms, that preparation for the world's work cannot be made in brief and intermittent attacks.

5. *Tying the school up with the life and occupations of the community.*—This sort of thing is reported from every part of the country and usually as though it were (as it is) the discovery of the times. It takes on many forms, such as allowing credit for non-academic exercises in school-time; allowing credit for work done at home or in the shop or store; arranging for industrial work in connection with school work; introducing into the school the study of community phenomena; interesting the home, church, press, and other institutions in the school's activities. The reasons alleged are that these things make for greater attractiveness of school life, for insight into the relationships of school and life, for fuller occupation of the pupil's powers, for the larger power that comes through versatility. There can be no doubt that, rightly administered, all these advantages obtain and that all of the arguments urged in favor of extra-time schemes apply equally well here; in fact, these are the ways, to quite an extent, in which to expend extra time.

6. *Modifications of recitation, assignment, and study schemes.*—These instances are almost as numerous as the schools of the country, and the substitutions proposed for present usages are of every degree of ingenuity. That there are enormous unrealized possibilities in the contact of the pupil with the teacher and in the exercises in which the pupil engages, or should engage, seems to be a profound and widespread conviction. The more common instances reported are such as the setting aside of a part of the recitation period for supervised study; devoting different recitations to different and carefully discriminated uses, such as reviews; preparation for future lessons; application of principles to problems; giving pupils assignments of a degree of difficulty adjusted to age and experience—all to the end that the pupil may come to acquaintance with, and use of, his mind; acquaintance with, and respect for, the minds of others; capacity to express himself on short notice. All these and many more are legitimate aims of the recitation, the study period, and various less formalized school exercises. The agitation in this field is a matter of immense promise. We have long said that it is not what one does that counts so much, it is the manner in which he does it. We still more than half believe (the wish being father to the thought) that there is a good deal in formal discipline. Now that we are really looking into the possibilities of teacher-pupil and pupil-school contacts, we may expect to realize something as good as if not better than the things which formal discipline, were it a possibility, would give us.

7. *The training of superintendents, principals, and teachers for expert service.*—Here again the air is full of hope. Teacher-training institutions are seriously, and as never before, considering just what goes into the make-up of the successful teacher. The teacher is being analyzed out to his ultimate constituents. He is being thought of no longer, or at any rate not so much, in a sentimental way. He is an expert. His function is to help children to learn—to become. He is thought of as immoral if he wastes time or permits it to be wasted. He is being held almost universally to a more strict account than even the minister. A great many of those who report see in the teacher the key to the whole economy problem. He is the inspirer, the technically trained adviser, as well as and more than the taskmaster. Not only are certification requirements and plans for such requirements stipulating more in detail the teacher's qualifications, but numerous provisions are being made and

advocated for the improvement of teachers while in service. To make the teacher's profession one of dignity and worth could well be one of the most practical objectives in the campaign for wise economy of time; in fact, and obviously, no advanced ground can be taken and held without the dependable teacher.

8. *Measurement and appraisal of results.*—This is presented last, not because least in importance nor because less frequently mentioned, but rather because everything else is, in a way, dependent upon it. School people are trying everywhere, some with scientific insight and some without, to estimate the outcomes, the results, following upon their hard work. There is general, wholesale, and wholesome suspicion of ritual in education and conventional justifications of ritual. It is quite unnecessary here to mention the proposed tests and measurement scales with which we are all familiar, or the surveys which are being undertaken or have been completed in all parts of the country. It may not be irrelevant to call attention to the fact that even the rank-and-file teacher is beginning to talk in terms of surfaces of frequency, the personal equation, etc., and their relations to the marking system, and that even in remote places the superintendent or principal is discussing such matters in teachers' meetings. From the movement for standards and measurements it is expected that we shall be able better to say just what is being done, just what each is doing, so that the educator shall be guilty neither of too much nor of too little endeavor, that one pupil may be rated accurately with reference to another, that one school may be rated accurately with reference to another, that one teacher may be rated accurately with reference to another, all to the end that competition may be intelligently and effectively encouraged.

Some other types of "progressive experiments in economizing time" appear in the returns, but will not be discussed in this paper. One other at least ought to be mentioned—the general campaign for improvement of the health and "condition" of pupils—and its mention is probably sufficient to bring to mind its intimate and enormously important relation to any true economizing of time.

### III

These gleanings, which are here so broadly sketched, seem to the writer to accord perfectly with the view expressed in the first section, that, essentially, the problem of economizing time in education in the

mind of the American educator reduces simply to making *better use* of time. Few persons, we take it, will be found who think that we have not time enough in which to do the work of education, and quite as few, probably, who think that the material, the subject-matter, available for education is not adequate. We have the things to do with and we have the time in which to do; we are doing pretty well as it is; but we are trying to do better—to use the materials we have, in the time we have, for the production of *better results*. We ought not to be in doubt as to the nature of these results; the very purpose of “America,” its democracy, indicates as the duty and the program of education in America: *to raise the levels of skill, intelligence, and character in as many as possible, as high as possible, as soon as possible*. This is our aim of education, and this is why we should economize time.

To economize time it is required that the right persons, under the right leaders, shall use the right materials, at the right time, in the right way. The right persons are those who are in “condition” to work and who see that the work they are doing is pertinent to the attainment of reasonably immediate and attractive goals. The right leaders are those teachers, principals, superintendents who are clear as to the purpose and worth of life, who believe in life, and who are possessed of the appropriate knowledge and technique. The right materials are such exercises as will lead, and *can be seen by those who take them to lead*, definitely, and with fair directness, to worthy and desired goals. The right time is early—before the edge of interest is dulled—before irrelevant habits are formed. The right way is industriously, competitively, cheerfully; with as much freedom as possible from distraction; with occasional refreshment and reanimation.

The right carrying out of such a program requires the further segregation of its elements. It is necessary to see clearly the particular matters administration must work with and upon, that emphasis and correlation may be intelligent. It is necessary to figure out just what are the *means* of improvement—of economy. We shall not be far wrong if we say we are economizing or getting in a way to economize wherever we are really securing one or more of the following: (1) better “condition” of pupils; (2) more definite, attractive, and immediate, as well as distant, goals; (3) a course of study more pertinent in content and more psychological in sequence; (4) wiser, more tactful, and more human teachers; (5) a student-body more devoted and industrious, as well as



cheerful; (6) a completer elimination or minimization of distractions; (7) more timely beginnings in all activities; (8) more industrious prosecution of work; (9) keener competition of the pupil, with himself and with others; (10) saner refreshment and reanimation of pupils.

That these are the *means* to a higher educational efficiency—to the economizing of time—and that they are believed in by American educators, is made to look probable by the fact that practically all attempts, of which we have learned, to improve things, in whatever part of the country, readily appear as attempts to accomplish one or more of them. These attempts are various—are undertaken sometimes with more, often with less, vision of the whole problem, but all of them are earnest attempts and may be called, in the best sense of the term, “experiments” in economizing time.



## PART III

### MINIMUM STANDARDS AND CURRENT PRACTICES IN THE FORMAL SUBJECTS

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## CHAPTER IV

### READING

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#### INTRODUCTORY NOTE

The word "reading" is here used to include the formal aspects of oral and silent reading. The content aspect of reading is discussed in a later chapter on literature. The determination of the minimum essentials in reading involves two problems, one the determination of standard vocabularies and the other the determination of standard rates of reading. One of these is discussed by Mr. Jones and the other by Mr. Courtis. In view of the active scientific experimentation and investigation that are being carried on at the present time in the subject of reading, a select bibliography by Mr. Gray is provided in order to introduce the reader to some of the more recent experiments.

#### SECTION I

##### STANDARD VOCABULARY

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In devising a standard test for primary reading one of the first tasks is the determination of a standard vocabulary. There are two possible ways of determining such a standard vocabulary, and it appears that both ought to be used. In the first place, the vocabulary should be one that is fundamental to childhood itself; it should be composed of the words most commonly used by children of the primary grades. On the other hand, words belong to phonetic families and the mastery of one word of a family provides a key for unlocking the mysteries of all the other words of that phonetic family. Consequently, words should be

chosen so as to open a way to an understanding of all of the larger phonetic families. These two bases of choice of words for a standard vocabulary are not contradictory, since the largest phonetic families are usually the ones that furnish the most words to the vocabulary of childhood.

In determining the vocabulary that is thought to be common to childhood, an analysis was made of the vocabularies of ten primers in common use. The words were tabulated in two lists, one called the phonetic list, and the other, the sight list. In the phonetic list were tabulated all of those simple English words that belong to the 150 common phonetic families. These are mostly words of a single syllable. In the sight list were tabulated various irregular words that do not employ one of the common phonograms, and most words of two or more syllables.

Table I shows a part of each of these two lists. The words given are arranged in the order of the frequency of their occurrence in the ten primers analyzed. The figure before each word indicates the number of times it occurred.

TABLE I

Phonetic Words	Sight Words
704 and	1,733 the
502 little	965 I
478 it	853 is
420 in	652 to
395 can	553 a
385 not	526 my
338 play	524 you
309 like	449 said
213 boy	389 see
206 ball	334 do
192 hen	331 he
178 run	315 we
176 that	278 have
176 up	277 come
170 now	237 me
169 big	224 are

Each of these two lists continues downward until it arrives at words that occur but once in the ten primers. In the phonetic list there are in all about 530 different words, and in the sight list about 430. Naturally these 960 words cannot be employed as a standard vocabulary.

It is necessary to take out the common elements from all of the primers. If one chooses from the sight list all of those occurring ten times or more, one has a list, not of 430 words, but of about 190 words. In selecting from the phonetic list the problem is more complicated. It is desirable to consider the frequency of recurrence of words, but at the same time it is desirable to consider the size of the phonetic family to which each of the words belongs.

In the solution of this complicated problem the first step was to determine the number of different words in common use belonging to each of the various phonic families. A mechanical word-building method was employed for gathering in all of the words belonging to each of the 150 common phonic families. To illustrate the matter, in Table II the middle column shows the phonic word-base. The column of figures to the left shows the number of words belonging to the phonic family using that particular word-base. The column of figures to the right shows the number of times any word occurs in the ten primers employing this particular word-base.

TABLE II

9	and	831	15	ank	49
13	an	622	16	ag	44
17	at	433	10	ang	22
8	am	164	5	ant	10
15	ack	130	15	ash	4
8	atch	117	5	ax	2
17	ap	104	8	ab	1
13	ad	78	8	amp	1

In actual practice it has seemed most convenient to keep the two lists of words separate. In drawing up a test of the ability of pupils to recognize the sight words one simply makes a random sampling from that portion of the list showing a frequency of ten words or over, each word in the test having a value equal to the frequency of its recurrence in the ten primers. The test of the phonic vocabulary is made up by taking a random sampling from the phonetic list. The value of each word, however, is represented by the sum of the recurrences of all words of that phonic family in the ten primers. While the value of each word for test purposes of the sight list remains the same as shown in Table I, the values for the phonic list are as shown in Table III.

TABLE III

1,101	hit	395	pen
831	band	391	hall
739	say	359	gun
622	can	315	pig
611	fill	309	like
541	tin	253	red
489	cow	252	wet
433	cat	242	cup
426	not	228	thorn
403	make	228	kick

This list continues down to the point where the word-values are only ten. In making up any given test all the words belonging to the same family as "hit" have the same value, namely, 1,101. This includes such words as "it," "bit," "sit," "kit," etc. Because of this, while there are only 118 word-families having a phonetic value of ten or over, yet there are in fact several hundred available words.

In actual work one can use the two standard vocabulary lists and make separate tests, or he can choose words from both lists and make a single composite test. The test may be made by using lists of words for the pupil's recognition, or the words may be built into sentences and read by the pupil. Both plans are in fact used. Table IV on pp. 41 and 42 shows a list of words that was used in testing the first-grade class in two different ward-school buildings and the results of the test. A card on which the words were printed in primer type was placed in the hands of the pupil and the teacher had in her hand a card similar to the one shown in the cut. On this card there are twenty columns. Ten pupils are chosen by taking alternate pupils. Since this is a random sampling the results represent fairly well the ability of the class and the efficiency of the teacher. As the first pupil pronounces the words of his list, the teacher checks in column I on her card the word upon which the pupil fails. The column then presents a fair picture of the pupil's ability to recognize words of primer quality. The second column represents the ability of the second pupil, and so on through the ten chosen to represent the class.

The table shows that in school A the pupils are well graded. All do about equally well. Apparently a few word-families have not been taught. With the exception of these, practically all of the words of the

TABLE IV  
FIRST GRADE

		SCHOOL A										SCHOOL B									
		Pupil										Pupil									
		1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10
622	man.....	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
104	cap.....	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
130	back.....	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	o	.	.
22	hang.....	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	o	.	.
44	flag.....	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
831	hand.....	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
117	catch.....	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1	lamp.....	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
49	thank.....	.	.	.	.	.	.	.	.	.	.	.	o	.	o	.	.	o	o	o	.
1	tramp.....	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
78	bad.....	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	o	.	.
433	hat.....	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	o	.	.
2	wax.....	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
731	gray.....	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	o	o	.
16	tail.....	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	o	.	.
11	pale.....	.	.	.	.	.	.	o	.	.	.	.	o	.	o	.	.	.	.	.	.
403	cake.....	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
40	main.....	.	.	.	.	.	.	o	.	o	.	.	.	.	.	.	.	.	.	.	.
6	cape.....	o	o	o	o	o	o	o	o	o	.	.	.	.	o	.	.	.	o	.	.
82	spade.....	o	o	.	.	o	o	.	o	o	.	.	.	.	.	.	.	.	.	.	.
40	plate.....	.	o	.	.	.	.	.	.	.	.	.	.	.	o	.	.	o	o	o	.
2	table.....	o	o	o	.	o	o	.	.	o	.	.	.	.	.	.	.	.	.	.	.
8	pane.....	o	o	o	.	o	o	o	o	o	.	.	.	.	.	.	.	o	o	o	.
20	care.....	o	o	o	.	.	o	.	.	o	.	.	.	.	.	.	.	.	.	.	.
252	get.....	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	o	.	.
253	bed.....	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	o	.	.
185	tell.....	.	.	.	.	.	.	.	.	.	.	.	.	.	.	o	.	.	.	.	.
395	hen.....	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
4	mend.....	.	.	.	.	.	o	.	.	.	.	.	.	.	o	.	.	.	o	.	.
4	begs.....	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	o	.	.
6	best.....	.	o	.	.	.	.	.	.	o	.	.	.	o	.	.	.	.	o	.	.
34	dress.....	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
128	read.....	.	.	.	.	.	.	.	.	.	.	.	.	.	o	.	.	.	o	.	.
17	feel.....	.	o	.	.	.	o	.	.	o	.	.	.	.	.	.	.	o	.	.	.
204	beat.....	.	o	.	.	.	o	.	.	o	.	.	.	.	.	o	o	o	o	.	.
65	dear.....	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	o	o	o	.	.
25	been.....	.	.	.	.	.	.	.	.	.	.	.	.	.	.	o	o	o	o	.	.
1,101	bit.....	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	o	.	.	.	.
611	still.....	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	o	o	.
132	hid.....	.	o	.	.	o	.	.	.	.	.	.	.	.	.	.	.	.	o	.	.
138	bring.....	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	o	o	o	.
228	stick.....	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	o	.	.
541	pin.....	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	o	.	.
70	drink.....	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
315	dig.....	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	o	o	.	.





list are recognized by all of the pupils. School B is shown to be of a quite different character, although supposed to be doing exactly the same type of work. Apparently all of the word-families have been partially taught, but none of them has been taught well. Certain pupils make a high mark; others, one that is very low. Apparently the teacher is inefficient. Those who learn without much teaching have mastered the words; those who have special difficulties and require careful teaching have not mastered the words. The class is badly balanced as a consequence.

One objection arises in connection with this mode of making the test—the words in the list are not in their natural setting. A pupil might fail to recognize a word that stands in isolation in the list and yet be able to recognize that same word if he met with it in sentences that he was reading. For this reason the tests have been made up into sentence-forms and printed as reading-lessons. The pupil instead of reading down a list of words reads what appears to him to be a usual reading-lesson. The teacher, however, has a card in which the words are arranged in a column as in the other case, and she checks the words missed by the pupils in just the same manner.

In marking the individual pupils, or in marking the teacher, it is necessary to take into account the relative value of the word as shown by the figures indicating the frequency of its recurrence. It is a greater error for a pupil to miss the word "man," which has a recurrent value of 622, than it is to miss the word "cap," which has a recurrent value of only 104. In the test shown on the accompanying figure the total recurrent value of all the words was 11,698. This is the figure that will be received by a pupil in case he recognizes every word. This is the figure that will represent the efficiency of the teacher in case every pupil recognizes every word of the test. In making up the record for either pupil or teacher it is necessary to deduct from this total sum the sum of all of the words missed. The remainder is a coefficient of ability to recognize the words of the standard vocabulary by the pupil; and an average of these remainders is a coefficient of efficiency for the teacher.

## SECTION 2

STANDARDS IN RATES OF READING

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The widespread interest in the movement for measurement in education is rapidly giving many investigators a new point of view. Measurement invariably leads to closer analysis and to a truer perception of the relative functions and worth of different phases of the work of any one type. It is not surprising, therefore, that in education the "yardstick" men are seeing more and more clearly that both the materials and the technique of teaching must be varied according to the results to be secured.

In a lesson designed to increase a child's appreciation of a great poem, for instance, a situation must be developed with a group of children, and the individuals of the group stimulated to react to the situation in such a way that each personality may make its own peculiar contribution according to its own peculiar interests and point of view. The lesson is successful only as it produces results which vary from individual to individual.

On the other hand, in a lesson designed to increase the child's mastery of the technique of reading, the work to be successful must eventually result in the attainment of a proper degree of skill. In such lessons the amount and character of the training each child receives must be varied according to his individual peculiarities and capacities, but the final product with all children should be the same. The uniformity of the product is here the chief characteristic of successful teaching.

The purpose of this report is to describe the results and conclusions reached in a first attack upon the problem of determining standard scores in some of the measurable elements that make up skill in reading. It is evident that before a uniform product can be secured there must be both an absolutely definite statement in objective terms of the goal to be reached, and a means of measuring the product at various stages of the process, to tell whether or not the goal has been attained. The two educational principles involved in such standardization may be concisely expressed as "definition of aim," and "limitation of training." Each will be briefly discussed before taking up the consideration of the experimental results.

*Definition of aim.*—It is the contention of the writer that, where the product is a mechanical skill, for successful teaching there must be a definite aim, and with this general statement probably few would quarrel. It is only as an effort is made to formulate the aim that difficulties arise in the minds of teachers. The general statement that schools should teach a child to read arouses no antagonism. But the “yardstick” men are not satisfied with such a statement. What does “to read” mean? Does a child know how to read who in half an hour is barely able to finish 100 words of simple prose, even if at the end of the time he understands perfectly all that he has read? Most courses of study say simply that a child should be able to read with a reasonable degree of skill for his grade. This investigation is an attempt to define the degrees of skill that are actually produced at each grade by present training.

The most evident measurable elements in skill in silent reading are the number of words read per minute and the degree of assimilation of the content. The first is easily measured, the second only indirectly through some form of reproduction. This introduces several foreign factors, and makes measurement and interpretation difficult. The most valuable product of the present study is, therefore, the knowledge gained as to the median rate of silent reading in the different grades. Accepting the median rates for each grade as the optimum rates, these results furnish the definite aims desired.

It should constantly be kept in mind throughout the discussions that follow that the study is suggestive only, its conclusions tentative. It represents an unsuccessful attack upon a complex problem, and its results are given here in the hope that it may lead others to check the conclusions reached and to repeat the work under more favorable conditions. Its chief value must be that it shows plainly the need of further studies of the same kind, and it furnishes tentative standards which will serve as a basis for experimentation on the part of those teachers who care to attempt the improvement of the efficiency of their teaching. It at least uncovers a problem whose solution would be of direct, practical, and lasting value, and it should serve to bring the question of objective definition of aim before those who have to do with the formulation of courses of study.

*Limitation of training.*—Anticipating somewhat the statistical data of the article, it may be said that the results show two striking characteristics: a great range of individual variation in every grade and a



constant average rate for any large group of a given grade. The great range of individual variation is a sign of inefficient teaching. In every grade there are some children who read very slowly or with great difficulty, and there are others who read very efficiently and at high speed. As there seems to be a well-marked value for average adult skill, it is quite probable that this represents the optimum rate at which the neuro-muscular co-ordinations involved in reading normally take place. If so, it is the duty of the elementary school to see that each individual attains this degree of skill. Otherwise he does not know "how to read." Moreover, the elementary school need not concern itself with the development of higher degrees of skill. As soon as the average adult rate has been reached, all time spent in *direct drill* tending to produce additional degrees of skill is likely to be waste. The bases for this statement are four: (1) By analogy from arithmetic, in which direct objective data for a similar statement have been secured, it is possible to say that after the optimum degree of skill has been attained *further development of skill* in reading is probably not a factor in determining the social efficiency of the individual, so that his time will be more profitably employed in other types of training; (2) individuals with greater natural capacities will reach the optimum level of ability with much less training than individuals less favored by natural inheritance; consequently for such individuals drill soon ceases to have any meaning, and may be positively harmful; (3) the development of higher levels of ability in preparation for a specific vocation is not the function of elementary-school training; (4) for the exceptionally able child the incidental training which comes through the use of any mechanical skill in real work—once the standard has been attained—will automatically develop his ability to higher levels without further direct drill, but it is the exceptionally able child *alone* who is thus able to profit by incidental training. Under such conditions it would seem wise to determine experimentally the optimum degree of skill needed by the average man, and deliberately to limit the training given by the school to the attainment of these standards. This implies, of course, a new form of schoolroom administration, one that will permit the shunting of an individual out of the training-class as soon as the required skill has been attained, and the putting of that skill to work in applied problems tending to develop the initiative and executive ability of the individual. As the experimental work of a few advance schools proves that such an arrangement



means a vastly increased efficiency of teaching, as well as a great improvement of the ultimate product, it is only a question of time before the principles of "definition of aim in objective terms," with consequent "limitation of training," will meet with general acceptance. In spite of its limitations, the results of the present study furnish tentative standards for a first experimental attack upon the problem of handling the teaching of reading from this point of view.

Turning now to the definite experiment to be reported, the tests will be described, a summary given of the results and conclusions reached, and a few suggestions made as to the value and use of the standards proposed.

The investigation of the rates at which children read was part of a larger co-operative investigation of the development of several of the abilities involved in training in English, and was carried on on a co-operative basis, following the general plan used by the writer in arithmetic. The tests were sold at cost to those who promised to send in duplicate copies of their results. Owing to the length and difficulty of the scoring, however, very few really sent in returns, and the standards are not as reliable as it was hoped they would be. The writer, however, is glad to acknowledge his indebtedness to the following: Miss E. M. Liggett, the Liggett School, Detroit, Mich.; English Committee, Teachers' Association, Detroit public schools; Mr. Charles M. Lamprey, Boston public schools; Professor Cyrus D. Mead, University of Cincinnati; Mr. D. F. Carpenter, superintendent of schools, Littleton, N.H.; Mr. H. L. Smith, superintendent of schools, Bloomington, Ind.; Miss Flora Wilber, City Normal School, Fort Wayne, Ind.

In this series of English tests, test No. 2 was the writing from dictation the first part of a simple story about a picture. For the third test the children were asked to compose the continuation of the story. When this was completed, they were given the real continuation of the story printed in 10-point type in lines 5 inches long, approximately 6 lines to the inch. The first section of the story (Part B) was 386 words long, and the children were glad to read it, to see how closely the "real" story agreed with the one they had written. They were asked to read at their natural rate, and all started at a given signal and were stopped at the end of one minute. A line was drawn around the last word read. This test will be called a test of normal reading. Immediately following this the children were measured as to their ability to remember whether

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Grade

Name

# BESSIE'S ADVENTURES. PART B.

No. of  
Words

Before the frightened little girl could decide what to do, the dog sat up 18  
on his hind legs and began to beg. He gave another impatient little "Bow!", 32  
but this time his bark did not seem so sharp and terrifying to Bessie, and 47  
her fears began to disappear. "Why, he's really a cute little doggie," she 60  
thought, and sitting up, she timidly offered him her bowl. The dog needed 73  
no second invitation, but eagerly lapped the milk until every drop was gone. 86

Bessie set the empty bowl down upon the doorstep and patted the little 99  
dog's head. He in turn was equally friendly, wagging his tail and trying to 113  
lick her hand. In a few minutes more the two were the best of friends, 128  
racing about the garden in a wild game of tag. Sometimes it was Bessie, 142  
laughing and screaming, who was chasing the dog this way and that in and 156  
out among the bushes of the garden; sometimes it was the dog, barking and 170  
jumping, who was chasing Bessie. More than once dog and girl were so 183  
much in each other's way that both fell down, rolling over and over on the 198  
soft grass. Not for a long time had Bessie had such a pleasant playmate. 212

They were on the front lawn now, resting a minute after a particularly 225  
wild romp. Suddenly, through the pickets of the fence, the dog spied a cat 239  
crossing the street outside. Immediately he dashed after her, squeezing 249  
between the pickets, and running down the street at top speed. "Here, 261  
doggie, doggie," the little girl cried, and ran after her playfellow, only to be 275  
stopped by the fence. From between the pickets, she could see both the cat 289  
and the dog rapidly disappearing down the street. Hot tears of disap- 300  
pointment welled from her eyes. She hurried to the gate and shook it; it 314  
was securely latched. Could she open it? Many times before had she 325  
tried, but without success. Little girls grow, however, and standing on the 337  
lower part of the gate, and stretching to her utmost, she was just able to 353  
press her little fingers against the latch. Click, and the gate swung open. 366  
Bessie was free to hurry down the street. The cat and dog had disap- 379  
peared around the corner of the next block. 386

Words
Number of
SCORE

Bessie's (Adventures, Experiences, Story.)

English. Test No. 4. Normal Reading



"Measure the efficiency of the entire school, not the individual ability of the few"

FIG. 1

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Name \_\_\_\_\_ Grade \_\_\_\_\_

No. of  
Words

BESSIE'S ADVENTURES. PART C.

Once out of the yard, Bessie ran straight down the street as fast as her	19
two little legs would carry her. From the corner around which the dog and	33
cat had disappeared, she could see, half way up the block of the cross street,	48
a dog barking furiously at the foot of a tree. So Bessie ran in that direc-	63
tion, getting quite out of sight of her own home. When she drew near,	77
however, she stopped running and stood gazing at the dog in dismay. Her	90
cute little playfellow was nowhere to be seen. This dog was larger and	103
darker, and his voice was loud and savage. What big teeth he had! How	117
viciously he growled and snapped at the cat up the tree!	128
Suddenly a sense of loneliness oppressed the little girl. The world	139
seemed big and strange; she must get back to her home and her mother.	153
She turned and started to run again, making for the corner. A great auto	167
truck thundered by, blowing its horn loudly. A group of children jeered	179
at her, and a small boy tried to block her way. Bessie reached the corner	194
at last but, confused, bewildered, she turned in the wrong direction.	205
On and on she ran, finding nothing but strange houses and unfamiliar	217
scenes. A suspicion that she was lost flashed across her mind and filled it	231
with terror. The suspicion grew to a certainty. She was lost! She would	244
never see her mother any more! In a dumb agony of terror the little girl	259
sank helplessly upon the nearest horseblock, then gave way to a storm of	272
sobs she could no longer restrain.	278

SCORE

Number of

Words .....

English. Test No. 5. Careful Reading.



Measure the efficiency of the entire school, not the individual ability of the few.

FIG. 1

or not certain words had been used in the story. Next they were given a third part of the story, but this time were told to read the same carefully, so that they would be able to reproduce what they had read. Again the conditions of starting and stopping were carefully controlled, and the time allowance was one minute. A line was drawn around the last word read. This will be called a test of careful reading. The scoring of the amount of the material reproduced proved long and tedious, and very few data on this point are available. This study will deal wholly with the speed of reading, and it should be clear that this is done, not because quality of understanding is *unimportant*, but of *necessity*. A copy of the material of these two tests is shown in Fig. 1.

Not all the individual scores were returned, so that Table I, giving the median rates per grade, was made up both from 132 class medians

TABLE I  
MEDIAN CLASS AND INDIVIDUAL SCORES BY GRADES

GRADE	TEST 4. NORMAL READING						
	Class Scores			Individual Scores			Standard
	No. of Scores	Median	M.D.	No. of Scores	Median	M.D.	
IV.....	26	165	15	291	161	48	160
V.....	29	173	32	358	180	52	180
VI.....	29	215	22	304	226	52	220
VII.....	26	252	24	256	256	52	250
VIII.....	20	235	30	163	262	60	280
Adult.....	2	316	.....	97	317	70	320
Total.....	132	.....	.....	1,469	.....	.....	.....

GRADE	TEST 5. CAREFUL READING						
	Class Scores			Individual Scores			Standard
	No. of Scores	Median	M.D.	No. of Scores	Median	M.D.	
IV.....	26	126	20	328	106	36	110
V.....	29	136	26	364	133	50	130
VI.....	29	169	30	277	172	44	160
VII.....	25	188	30	256	178	48	185
VIII.....	20	205	40	163	200	50	200
Adult.....	2	172	.....	90	184	58	200
Total.....	131	.....	.....	1,478	.....	.....	.....

representing about 3,000 children and from the distribution of nearly 1,500 individual scores. The class results, however, agree closely with the medians derived from such individual scores as were secured, and it is probable that these values would not be greatly changed had a larger number of scores been available.

The results of Table I are shown graphically in Fig. 2, and over the heavy line representing the medians of the grade medians has been

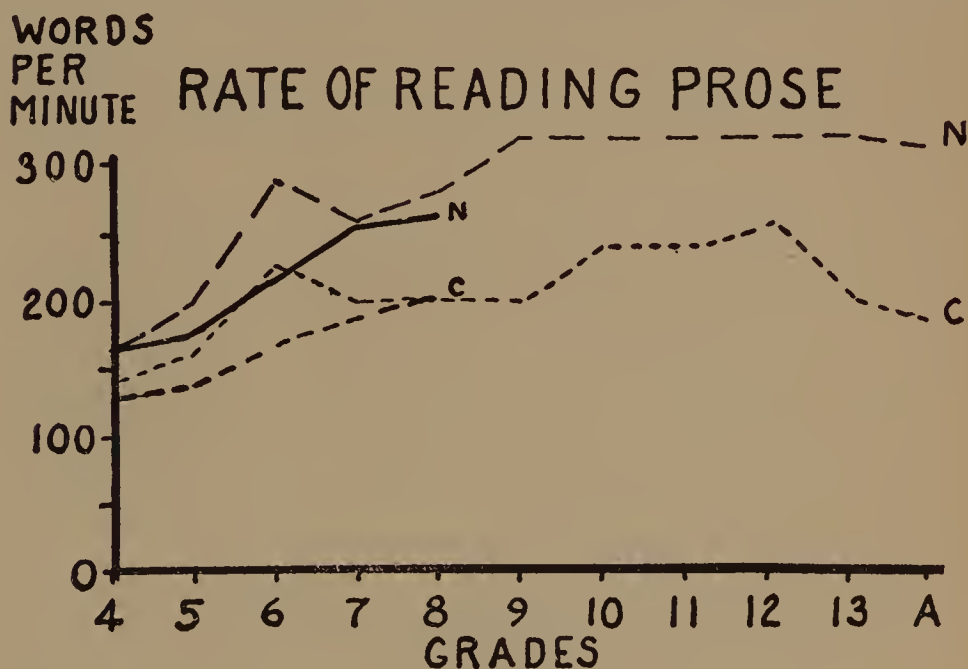


FIG. 2

drawn the record from a single school and from a group of adults. Taking up the class scores first, it will be seen that there is a steady progress from Grade IV to Grade VIII, fairly constant from the fifth grade on. The final value approximates closely the average adult score, if allowance is made for an eighth-grade drop in Test 4.

The curve in light dotted line represents the results from a private school for girls. Note that the curves for both normal and careful reading are irregular, owing to the exceptional performance of the sixth-grade class, but if this class be disregarded, it will be seen that the steady progress through the grades reaches adult speed at the ninth or tenth grade and afterward does not vary widely from these constant values.



This suggests that a value of approximately 320 words per minute for rapid reading and 200 words per minute for careful reading represent adult ability and the general limit of productive training. Ability to scan a passage rapidly and ability to read and understand—to read in order to retain—as developed by direct training, would not need to rise above the limits given. The scores given in Table I may well represent

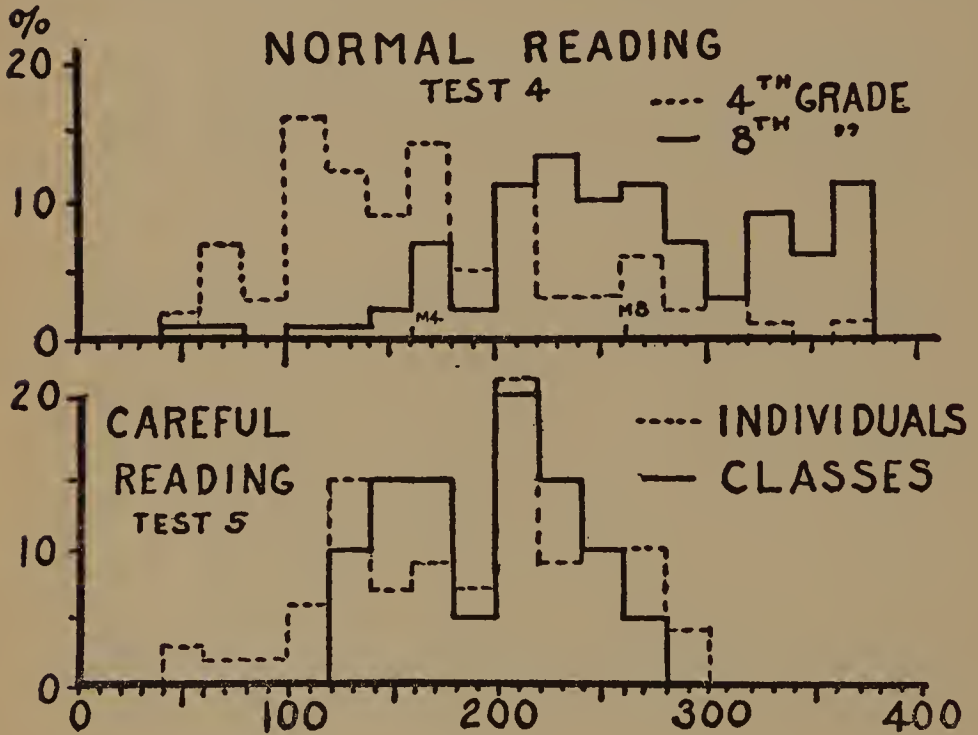


FIG. 3

standard scores toward which to work. The actual standards given in the table were obtained by smoothing the development curves derived from the median scores.

A significant feature of the results is the wide distribution of individual scores and the narrower range of class scores. In Table I compare, in both tests, the median deviation (M.D.) for class medians with that for individual scores. In Table II the distribution of 163 individual scores and of 20 classes, both eighth-grade, are given for comparison.

Fig. 3 shows the comparison graphically. This difference between the two distributions shows that the same conditions exist as in arith-

metic, and that the same forces are at work; in other words, that the most important factor to be controlled in teaching children to read is the factor of individual differences. In Table II, also, is given the distribution of individual scores of fourth-grade children and of adults. Note that even in the fourth-grade median adult speed is attained by a few individuals, while among adults some fall below the median fourth-grade rate. This tremendous range of individual variation is proof that in the teaching of reading the school at present has little control over the product. Experience shows that control is possible if a definite task is set before each child and he is allowed to reach the goal in his own way. The table and the results it expresses make it possible to say that only as standard practice tests are devised which will enable a teacher to handle a group of children, yet let each child grow in his own way and progress at his own rate, can the teaching of reading be made much more efficient than it is at present.

*Uses of the standard scores.*—The primary value of standard scores has just been indicated: they give the information needed for the construction of standard practice tests, for the development of standard skill in reading. They also serve the teacher as a guide in the assignment of lessons. It is a simple matter to estimate by means of the number of words in a line and the number of lines on a page the length of time it will take to read over once a passage in a textbook. The writer has before him a textbook with approximately 260 words to the page which was assigned for close study by adults at the rate of about 20 pages a day. As each page would require on the average a little more than a minute to read over once; to read the assignment through three times would alone take up the allotted hour of study, to say nothing of the time required for collateral reading, analysis, digestion, and use of the material gained in solution of problems. Reading and reference lessons are too often assigned without regard to the time required to read the material over thoroughly, with a result that children are soon confirmed in the habit of hasty reading without assimilation. Teachers everywhere, following the general method of this study, should determine the average rate of reading of their classes in the various types of textbooks used by their pupils and assign all reference reading with such standard rates in mind.

*Diagnosis.*—The child whose rate falls below the standard for his class is in need of special assistance. The causes of faulty reading are



many, not one, and the remedy to be applied differs from individual to individual. The child that has not learned to read a line with but three or four movements of the eyes must be given special training to acquire this necessary habit. The child unable to grasp a strange word needs a different treatment. The child slow in his reaction times will benefit by still a different training. But only as these special types of training are provided will the children showing the different defects be able to profit by the ordinary classroom work to the extent the effort of the teacher would warrant. Standard scores in standard tests serve then to point out the children in need of special individual study by the teacher.

*Supervision.*—Standard scores are also of value from the point of view of supervision. The superintendent or supervisor cannot tell what is done in a room when he is not present. The temptations to misuse the school time are so many and the difficulties of keeping work evenly balanced so great, that even the best of teachers may vary widely from the course as outlined. Where standard tests are given, however, it becomes possible to express the results of the teaching effort in terms of efficiency, if efficiency be defined as the percentage of the total product that comes up to the standard. If of a sixth-grade class of 50, 20 children prove able to read at the rate of 200 words per minute in a final test in June, while in a similar class of the same type of children 40 are able to read at the given rate, the differences must be sought in the work of the two teachers. The advantages of standard scores are that they both *define the product desired* and *limit the amount of the drillwork*, without in any way interfering with the freedom of the teacher to meet the standards by any method he may wish to use. When superintendents and teachers once appreciate the satisfaction of this means of supervisory control, measurement of efficiency in such terms will be generally adopted.

*Suggested problems.*—Attempt to reach 100 per cent efficiency. Measure the children at the beginning of the year as to rate of reading in several different materials (that is, rate of reading a story in readers, a reference in history, a lesson in geography, etc.), following the general method outlined above. Work with individual pupils below standard until the standard score is reached. Excuse the able from reading-drill. Measure results at end of year and determine amount of improvement of class and of individual, and compare results with work of another teacher both as to efficiency and as to time-cost.

Use standard scores in determining the amount of material to be assigned in one lesson, checking up on the time spent by the children until the proper length for a lesson is determined in terms of the standard rate of reading. If an eighth-grade child can read at the rate of 200 words per minute and he has ten minutes for study, it would obviously be wrong to assign a reference of 2,000 words to be studied. Experiments seem to show that with one reading a child will be able to reproduce about one-half of the essential ideas. It is quite possible that a reference of 500 words would be sufficiently long. But whatever the proper length, the relation to the rate of reading should be known, and the study of children should be supervised until they are able to "learn" a standard length of lesson in a "standard" time.

*Note.*—Definition of aim and limitation of training are possible in all subjects and grades, and certain school men in many different localities are actively carrying on the necessary experimentation by which the evolution of new administrative methods is forwarded. For the benefit of those who have not given the matter thought heretofore, the following objective standards are suggested, as those now available for practical school work:

### 1. Reading:

A child in Grade.....	IV	V	VI	VII	VIII	
Should be able to read simple						
prose at the rate of.....	160	180	220	250	280	words per minute
and to reproduce 50 per cent of the ideas in a 400-word passage after one reading.						

### 2. Writing:

Handwriting.—A child whose daily penmanship in spelling, English, history papers, etc., is as good as quality 12 of the Thorndike scale (or 60 on the Ayres scale) needs no further direct drill in handwriting.

Rate of writing.—A child should be able to write

	An original story (after reflection)	} at a rate of				
	A reproduction of a story read to him					
Grade.....	III	IV	V	VI	VII	VIII
Original story.....	9(?)	12	14	16	17	18 words per minute
Reproduction.....	11(?)	14	17	19	21	23 " " "

### 3. Composition:

The quality of his story or composition in

Grade.....	IV	V	VI	VII	VIII
Should be.....	45	49	53	58	65
on the Hillegas scale.					



## 4. Arithmetic:

Four operations with whole numbers, using examples like the following:

TYPICAL EXAMPLES

Addition	Subtraction	Multiplication	Division
345 487 631 205 943 683 859 175 794	$\begin{array}{r} 3479127468 \\ 1867396737 \\ \hline \end{array}$	$\begin{array}{r} 4179 \\ 36 \\ \hline \end{array}$	$67 \overline{)61707}$

Children in the various grades in the time indicated should be able to work correctly the number of examples in the following table:

Grade	Test 1 Addition	Test 2 Subtraction	Test 3 Multiplication	Test 4 Division
III.....	3	4	3	2
IV.....	5	6	5	4
V.....	7	8	7	6
VI.....	9	10	9	8
VII.....	11	11	10	10
VIII.....	12	12	11	11
Time allowance.....	8 minutes	4 minutes	6 minutes	8 minutes

Rule for finding the efficiency of teaching in any topic in which a definite objective aim has been established: Test the entire class under uniform conditions as to time and instruction, using sufficient material of a single type to keep the most able busy during the entire time. Score results on a uniform basis. Determine the number of scores that equal or exceed the standard. Find what per cent these scores are of the total number of scores.

*Remarks.*—Faulty control of the conditions of testing is responsible for much of the self-deception which now exists among teachers. For instance, it is foolish to judge the efficiency of the teaching of handwriting from samples obtained where the children are simply told to submit samples of their handwriting. The best specimen for judging the writing of an individual is that written as part of the first draft of an original story. Even then, although satisfactory in quality, the

writing should not be accepted as standard unless written at the standard rate for the child's grade. Only as proper speed was maintained, and only as the handwriting in the specimen was fulfilling its proper function (that of recording thought), should it be considered as suitable for measurement of the handwriting training. For many purposes it is enough, however, to control the rate of writing in a dictation exercise. For this purpose the following table enables the dictation to be given at the proper rate:

	GRADE					
	III	IV	V	VI	VII	VIII
Number of seconds per letter.....	?	1.2	1.0	0.85	0.73	0.63
Number of seconds per word.....	?	4.3	3.6	3.2	2.8	2.6
Average number of letters per word....	?	3.5	3.6	3.7	3.9	4.1

For instance, in dictating the following paragraph to an eighth-grade class in June, a watch having a second hand should be used. When the second hand reaches 60 the first sentence should be said, and because it contains 67 letters the teacher should wait 42 seconds ( $67 \times 0.63 = 42$ ) before saying the next sentence, and so on. The numbers in parentheses show the position of the second hand when the sentence following should be dictated.

(60) The trees are heavy with leaves; and the gardens full of blossoms, red and white. (42) The whole atmosphere is laden with perfume and sunshine. (12) The birds sing. (21) The cock struts about and crows loftily. (43) Insects chirp in the grass, (57) yellow buttercups stud the green carpet like golden buttons, (29) and the red blossoms of the clover like rubies.

*Spelling, punctuation.*—The time-factor is very important in tests in spelling and punctuation. A correct result, written legibly and easily (at proper speed), is alone to be desired. The dictation exercise above is also a spelling and a punctuation test, but even in the conventional spelling-lesson the rate should be controlled. Illustration (eighth grade):

Time	Word
(60).....	which
( 3).....	separate
( 8).....	rustle
(12).....	receive, etc.

## SECTION 3

## SELECTED BIBLIOGRAPHY UPON PRACTICAL TESTS OF READING ABILITY

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WILLIAM S. GRAYDepartment of Education, University of Chicago

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The articles are arranged inversely in the order of their publication; that is, the most recent appears first and the oldest appears last.

Schmitt, Clara. "School Subjects as Materials for Tests of Mental Ability," *Elementary School Journal* (continuation of *Elementary School Teacher*), XV, 150-61, November, 1914.

This article discusses the possibility of using reading and other school subjects to form a series of tests which can be used from year to year to measure the development of special abilities. The accomplishment of the child in reading is discussed as to quantity and quality. The methods and results of reading tests for normal and defective children are discussed in detail.

Thorndike, E. L. "The Measurement of Ability to Read," *Teachers College Record*, XV, 207-27, September, 1914.

This article presents preliminary scales and tests for the measurement of achievement in reading along the following lines:

1. A pupil's ability to understand the meaning of words and sentences seen, so far as concerns (a) the understanding of words singly, and (b) the understanding of sentences and paragraphs. ("A Scale for Visual Vocabulary" and "A Scale for Measuring the Understanding of Sentences and Paragraphs," by E. L. Thorndike.)

2. A pupil's ability to pronounce words and sentences seen in a series of paragraphs arranged in the order of increasing difficulty. ("A Tentative Scale for the Measurement of Oral Reading Achievement," by William S. Gray.)

Brown, H. A. "Measurement of Efficiency of Instruction in Reading," *Elementary School Teacher*, XIV, 477-90, June, 1914.

This article treats of the relation of the measurement of reading ability to the reconstruction of methods of teaching. The factors involved in measuring reading efficiency are outlined, and a practical method of testing reading achievement is given in some detail.

Judd, Charles H. "Reading Tests," *Elementary School Teacher*, XIV, 365-73, April, 1914.

Standards for measuring efficiency in school subjects are defined. The value of comparison between groups undertaking similar work is emphasized. Practical suggestions are given concerning the selection of material for reading tests and concerning the administration of the tests.

Courtis, S. A. "Standard Tests in English," *Elementary School Teacher*, XIV, 374-92, April, 1914.

The six tests used by Mr. Courtis to determine standard rates of reading and to determine comprehension are presented in a single series under the head of "English Tests." The relation of these tests to the measurement of reading ability is discussed.

Pinter, Rudolf. "Oral and Silent Reading of Fourth Grade Pupils," *Journal of Educational Psychology*, IV, 333-37, March, 1913.

The problem discussed is: Is the percentage of subject-matter retained or comprehended increased or diminished by the supposed help of oral reading?

Bowden, Josephine. "Learning to Read," *Elementary School Teacher*, XII, 21-33, September, 1911.

This article reports the results of an experiment to determine how children recognize words.

Hendricks, Eldo L. *A Preliminary Report of a Study in Reading*, Silver, Burdett & Co., 1911.

This pamphlet presents the methods and results of a study of the rate of silent reading and the degree of comprehension in grades I A, IV A, and VIII A.

## CHAPTER V

### HANDWRITING

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The aim of these reports, as determined by the committee under whose direction they have been prepared, is the determination of the minimum essentials in the subjects of the curriculum which are concerned. In the case of a subject like handwriting, the object of which is the development of skill, minimum essentials are to be considered, not as absolute requirements, but as dependent in a measure upon the time and effort which are required to attain them. It is germane to the subject, then, to consider both the amount of skill which it is desirable that a pupil shall attain from the point of view of the demands of society and of his later life, and also the time which is required in order to attain this skill. The subject, then, may be approached from either side. We may ask, on the one hand, what degree of excellence in writing the pupil should possess in order to be able to meet the demands which will be made upon him; or we may ask, on the other hand, what degree of skill is attainable under specified conditions in the school.

We shall attack the second phase of the problem first, and assume for the time being that a reasonable amount of skill is desirable and necessary for every elementary-school pupil. We shall attempt to define more particularly what a reasonable degree of skill is by the study of the skill which is actually attained by the pupils in a large number of cities in the United States. We shall then further attempt to determine whether this degree of skill will be actually required by the pupil, from a result of a questionnaire sent to various business houses regarding the degree of excellence in writing which they demand of applicants for positions.

In order to obtain a basis upon which to construct a standard of attainment for the pupils in the various grades of the elementary school an investigation was made of the proficiency in handwriting of the children in a number of the larger cities of the United States. The



results of this investigation, which are presented in summary form in Table I and in Chart I, represent the average speed and the average legibility of the writing of the children in each grade from the second

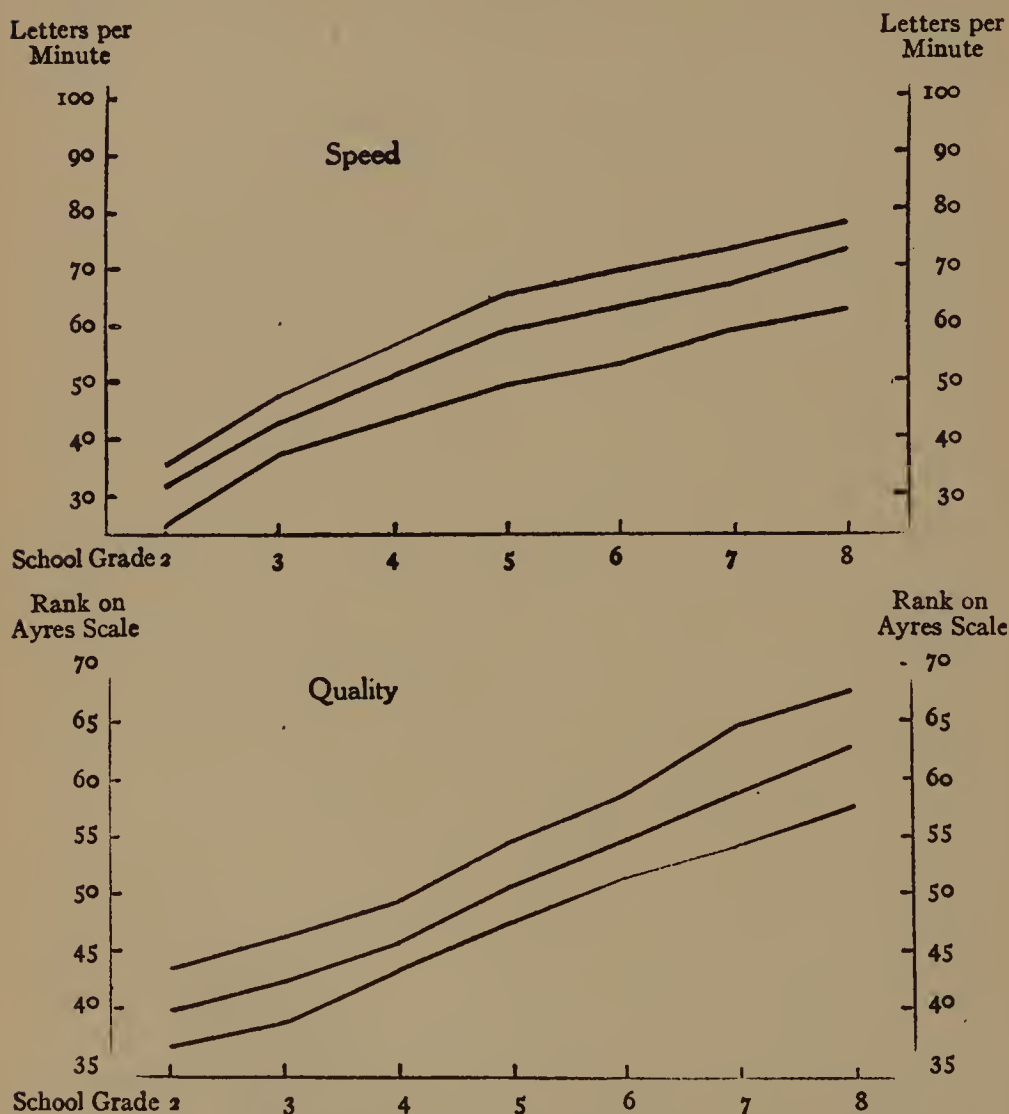


CHART I.—Average speed and quality (middle lines) and average of upper and lower halves in all the schools investigated.

to the eighth. This average of attainment for all the schools is represented by the middle line in each of the charts. In addition to this, the schools were divided into two groups, on the basis of the total efficiency

of the writing from each school. The first group represents all of those who are above the average in attainment, and the second group is the remainder. The upper line in each chart represents the average attainment of the upper half, and the lower line the average attainment of the lower half.

TABLE I

AVERAGE SPEED AND QUALITY AND AVERAGE OF UPPER AND LOWER HALVES IN ALL THE SCHOOLS INVESTIGATED

		SCHOOL GRADE						
		II	III	IV	V	VI	VII	VIII
Speed	Average of upper half...	35.4	47.7	56.2	64.9	69.2	73.4	77.8
	Average of all.....	30.6	43.8	51.2	59.1	62.8	67.9	73.0
	Average of lower half...	24.4	37.4	43.4	49.9	52.8	58.5	61.2
Quality	Average of upper half...	43.5	46.1	49.3	54.5	58.5	64.7	67.8
	Average of all.....	39.7	42.0	45.8	50.5	54.5	58.9	62.8
	Average of lower half...	36.8	38.8	43.2	47.4	51.5	54.2	57.6

A word should be said regarding the manner in which the data for these charts were collected. A questionnaire was sent to the superintendent of each city in the United States of 30,000 inhabitants and over, and in addition to this a request that a test be made in two representative schools of the system. Minute directions for the conduct of the test were given in duplicate form so that one copy might be had by each person conducting the test. The test was to include the measurements of the speed and also of the legibility or the quality of the writing. A measure of the speed was obtained by requiring the pupils to write for two minutes. The number of letters which were written per minute was then taken as the measure of speed. The papers were sent to the writer at the University of Chicago, who had them graded by the members of a class in experimental education.

Fifty-six cities responded to the request that a test be made, and sent the papers in to be graded. Of these papers, 24 were selected at random from each grade of each school. Thus there were 336 papers selected from each school. In round numbers, allowance being made for the fact that papers from some schools were missing, there were about 34,000 papers graded. The average for each grade, then, is represented by about 5,000 papers.

The grading for legibility was done by means of the Ayres scale, since this is presented in a somewhat more systematic form than the Thorndike scale, and since previous investigations indicated that it gave a slightly greater reliability of judgment. The experience which was gained from using the scale in the investigation and an investigation which was made by Mr. H. T. Manuel and presented in satisfaction of the requirements of the Master's degree in the Department of Education of the University of Chicago indicate that the individual measurements must be taken with a large allowance for error. The mass results, however, which are represented in the curve of the average and the curves of the upper and lower halves of the schools represented, may be taken to be reliable, since they are the combined results of the measurements of a large number of investigators. In order that the writing of the children in a particular school or school system may be compared with this standard, it would be necessary that it be examined by several investigators. The grades obtained by a single grader upon a group of papers have one chance in two of being as much as half a step on the scale above or below that which would be obtained by a large group of investigators. Half a step is equivalent to more than the average difference between successive grades.

The upper line in the chart, then, may fairly be taken to represent the legibility and the speed which are attained by the better schools in the larger cities of the country. Care was taken to avoid the possible error due to the fact that some schools might be superior in speed but inferior in legibility, or vice versa. This fact would affect the results if the schools were grouped to obtain the upper half by speed and legibility separately. In this investigation the schools were ranked separately at first, and then a combined rank was formed, and the upper half in this combined efficiency was determined upon. The upper line, then, represents those schools which occupy the upper half in combined efficiency, and the lower line those which occupy the lower half in combined efficiency.

The upper line may be taken as a basis or a starting-point for discussion in the determination of standards for attainment. This places the standard at a point which is equaled or excelled by approximately 25 per cent of the schools of the cities represented, and which is fallen below by approximately 75 per cent of the schools. A standard which is equaled or excelled by about 25 per cent of the schools of the country is

one which is obviously perfectly possible of attainment. It is a standard which is attained under the ordinary conditions of school life. We have no reason to presume that the conditions in these cases are superior to those in the case of the other cities which were studied; or, to speak more correctly, the conditions which have produced the superiority in certain cities over others are such as might be obtained in the cities which show inferior results. Among the conditions which might conceivably produce a superiority in results are: the superior native ability of children; the superior ability of teachers, or superior training; a superior method of supervision or of teaching; and a larger amount of time spent in the study of the subject.

Among these possible causes we may rule out the first, since there is no reason to suppose that the average capacity of pupils in the cities of the country varies to any considerable extent. So far as the efficiency of the teachers or of the methods which are used is concerned, this is a matter which is under the control of the school administration, and if it can be shown that superiority in the results from certain schools is due to these factors the responsibility lies upon the administration to see that it obtains the superior conditions in its own school system. The last factor, that of the amount of time spent, is answered in the results of the questionnaire which was included in the present investigation.

The distribution in time which was spent upon handwriting in the cities which replied to this question is shown in Table II. It is seen from this table that there is a wide variation in this matter. Some cities spend no time in certain grades, or spend upon an average only about 45 minutes per week, while other cities spend nearly three times as much time as this. One city, in fact, spends upon the average five times as much as do two other schools.

The average amount of time spent in the grades taken as a whole does not vary so much as the amount of time spent in each grade taken separately. This is due to the fact that some schools spend more time in the earlier grades and others in the later grades. It is frequently the case that little or no time is spent in the first two grades or in the last two. Three typical modes of unequal distribution appear according as a larger amount of time is spent in the earlier, the middle, or the later grades than in the remainder. The time distribution in a number of cities which represent these types is shown in Table III.

TABLE II

DISTRIBUTION OF TIME SPENT IN TEACHING WRITING IN 66 CITIES

(The figures in the body of the table indicate the number of cities which the amounts of time specified in the margin.)

TIME IN MINUTES	GRADE								AVER- AGE OF ALL GRADES
	I	II	III	IV	V	VI	VII	VIII	
?.....	2	I	I	I	I	I	I	2	I
0.....	4	2	.....	.....	.....	.....	I	4	.....
30-39.....	I	.....	.....	.....	.....	I	I	3	.....
40-49.....	I	I	.....	.....	.....	.....	6	6	2
50-59.....	12	10	5	4	2	2	.....	I	7
60-69.....	3	3	4	5	12	15	20	18	13
70-79.....	20	22	27	22	22	25	19	17	18
80-89.....	2	4	4	7	5	4	6	6	13
90-99.....	I	2	2	2	3	3	8	4	7
100-109.....	16	15	16	22	16	11	2	4	.....
110-119.....	.....	.....	.....	.....	.....	.....	.....	.....	2
120-129.....	2	4	3	I	4	2	I	.....	2
130-139.....	.....	.....	I	I	.....	.....	.....	.....	.....
140-149.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
150-159.....	I	I	2	.....	.....	I	.....	.....	.....
160-169.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
170-179.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
180-189.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
190-199.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
200-209.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
210-219.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
220-229.....	.....	I	I	I	I	I	I	I	.....
230-239.....	.....	.....	.....	.....	.....	.....	.....	.....	I
240-249.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
250-259.....	I	.....	.....	.....	.....	.....	.....	.....	.....
Total no. of cities.	66	66	66	66	66	66	66	66	66
Median.....	74.8	77.0	78.2	81.6	77.9	75.3	71.9	69.2	75.3

TABLE III

THREE TYPES OF DISTRIBUTION OF TIME GIVEN TO WRITING IN THE DIFFERENT GRADES (IN MINUTES PER WEEK)

	GRADE							
	I	II	III	IV	V	VI	VII	VIII
Average of 12 cities.....	96	96	90	80	79	71	67	57
Average of 11 cities.....	53	58	80	90	88	68	55	54
Average of 6 cities.....	43	52	56	65	69	73	74	62*

\* Drop due to the fact that one city gives no time in Grade VIII.



The question immediately arises whether the larger amount of time spent by some of the schools enables them to attain a greater efficiency. If so, it would then be necessary to raise the question whether the added efficiency is a justification for the increased amount of time. If, however, it is found that those which spent the larger amount of time do not thereby profit in the efficiency which is gained, the second question does not need to be asked.

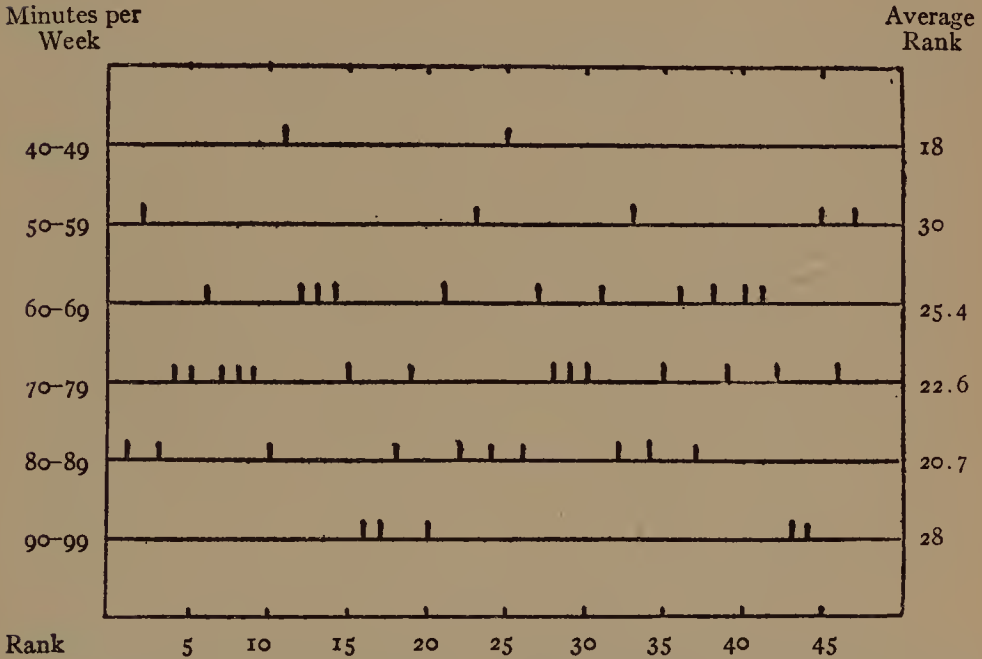


CHART II.—Distribution in rank of 47 cities arranged in classes according to the time spent on writing.

The comparison in the rank of schools which spend different amounts of time upon writing is shown in Chart II. Each vertical line in this chart represents one city. The lines upon the same horizontal line represent the cities which spend the same amount of time in writing. Those on the upper line spend the least amount of time, and those upon the lowest horizontal line, the largest. The position of the lines in the right or left direction represents the rank which was obtained by the schools as a result of the test. Those which are at the left side of the chart are higher in rank, and those which are toward the right are lower.

If the spending of a large amount of time in writing produces a corresponding gain in efficiency, the vertical lines should be grouped

along a diagonal line running from the lower left-hand corner to the upper right-hand corner. That is, those which spend the less amount of time should be toward the right, and vice versa. It is evident that this situation is not represented by the facts. The cities which spend the various amounts of time are scattered throughout the range. For example, of the two cities which spend on the average only 45 minutes per week, one has the eleventh rank and the other the twenty-sixth; while two of the cities which spend an average of 95 minutes have the rank of forty-three and forty-four, very nearly at the bottom of the list. The average rank attained by the cities of each time-group are represented in the column to the right. It will be seen that with the exception of the shortest-time and the longest-time groups there is some increase in efficiency with an increase in time, but this increase, which holds on the average, is slight, and the exceptions are so great that the amount of time spent appears to have little influence upon the results.

Another means of judging the effects of the length of time spent in handwriting upon the efficiency of the product is to compare the amount of time spent by the cities which compose the upper half with those which make up the lower half. When this is done it appears that the amount of time is practically equal. The 23 cities of the upper half spend  $73\frac{1}{6}$  minutes per week, and the 23 cities of the lower half,  $73\frac{3}{8}$  minutes.

In endeavoring to interpret these facts it is not necessary to assume that the amount of time spent has no effect upon the efficiency of handwriting teaching. It does appear to mean, however, that it is not desirable to spend more than ten or fifteen minutes a day when this time is spent all in one period. The data which are at hand do not give sufficient information upon which to base a conclusion as to the best amount of time to give. Such a conclusion could best be based upon experiments in which different amounts of time were tried out with the same class or with the same school, and with other conditions remaining the same. The conclusion which can be drawn from the data, however, is that the superior attainment of the schools in the upper half of the whole group is not due to spending a greater amount of time in handwriting teaching.

Taking the average attainment of the upper half of the schools, as represented by the upper curves upon Chart I, as a tentative standard or as a basis of discussion, we may look upon them from another point

of view. If we compare the curves for legibility and for speed, we see that the former advances steadily and at about an equal rate from the first grade to the eighth; while the curve for speed advances rapidly up to the fifth grade and then very slowly from the fifth grade to the eighth. The difference in speed of writing between the second grade and the fifth is  $29\frac{1}{2}$  letters per minute; while the upper grades on an average gain only  $12\frac{9}{10}$  letters per minute above the fifth grade. This break in the rapidity of advance in speed furnishes a point of attack and raises the question whether it is necessary and desirable.

If we ask ourselves the reason for this difference in the speed and legibility, part of the answer probably is to be gotten from the fact that legibility is more readily tested in the school and that more attention is paid to it than to speed. The permanent result of the child's writing is represented in the quality of the writing, while the rapidity with which he writes is not evident merely upon the inspection of the paper. The teacher will therefore more readily notice and will be more likely to criticize deficiency in legibility than deficiency in speed.

These considerations do not serve to explain, however, why there is a more rapid advance in speed in the earlier grades than in the later ones. This difference may perhaps be accounted for by the fact of rapid increase in motor ability up to the period of adolescence, and the slower increase in ability from that time forward. Chart III shows the curve of progress in rapidity of tapping from an examination of a thousand school children by Gilbert. The parallelism between this curve and the curve showing the speed of writing is striking. If the hypothesis which was presented in the preceding paragraph, then, is correct—namely, that the progress in legibility is more continuous than in speed because the teacher can observe it better and is supposed to criticize this point more than that of speed—it will serve to explain, not why the progress in speed becomes less rapid after the sixth grade, but why the progress in legibility continues while that of speed does not.

We may ask, then, whether the facts as they are presented are to be taken as a basis for the construction of a standard, or whether it is reasonable to expect and demand that progress in speed continue in the same way as does progress in legibility. If such continuation is to be attained, it can be had only by the application of greater stimulus toward speed than is commonly given. That the attainment of a much higher speed in the higher grades is possible without undue effort is shown from

the records of the group of seven schools shown in Table IV and Chart IV. The average amount of time spent by these schools is 73½ minutes, which is not greater than that spent by the other schools which are the subject of this study, and the total efficiency of each is high enough to place it within the highest quarter of all the schools.

Taps per  
Five Seconds

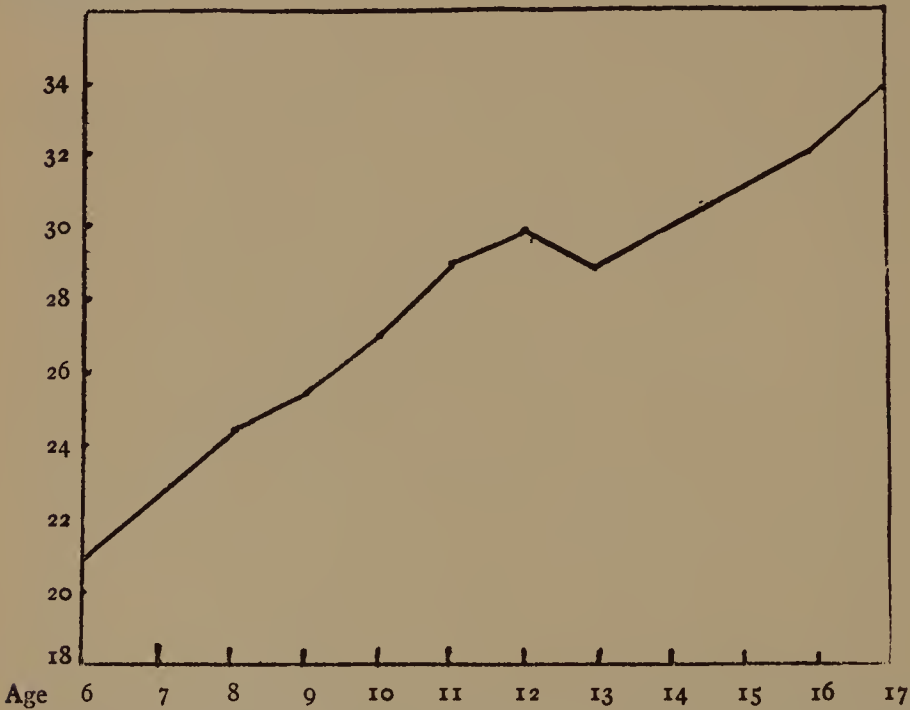


CHART III.—Progress with age in rate of tapping (after J. A. Gilbert, *Studies from the Yale Psychological Laboratory*, 1894, II, 65).

TABLE IV

SPEED OF SEVEN SELECTED SCHOOLS FROM THE HIGHEST QUARTER OF THE WHOLE GROUP IN TOTAL EFFICIENCY

	SCHOOL GRADE						
	II	III	IV	V	VI	VII	VIII
Speed.....	45.4	53.1	60.0	68.1	71.7	79.6	94.2

The attainment of these schools indicates that under favorable conditions there may be a falling off in the rate of progress in speed at the fifth grade but that the loss may be made up by the time the eighth grade is reached.. It is therefore not unreasonable to require a more rapid rate of progress from the fifth to the eighth grade, when it is considered from the point of view of the capacity of the pupil. Whether it, as well as the other features of the standards which have been described, is reasonable from the point of view of the demands which will be made upon the pupil we shall have to consider next.

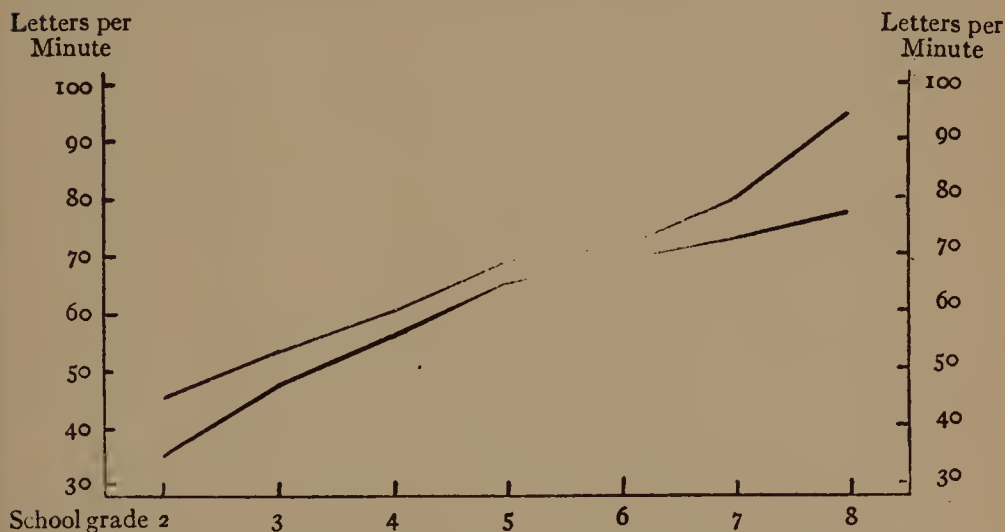


CHART IV.—Average speed of writing of seven schools which are in the upper 25 per cent of the whole group in total efficiency (upper line) and the average speed of the upper half for comparison (lower line).

Table V shows the results of the questionnaire which was sent to various employers of clerical workers asking for information regarding the degree of excellence in writing which they require of the applicants for positions. The firms which are represented are among the largest in Chicago and may be taken as typical of the kinds of business houses which they represent. The results can be taken only as suggestive, since they are limited in the number of cases which were investigated. Taken as a whole, however, they give some basis for drawing the conclusions as to the degree of excellence in writing which pupils should attain at the end of the elementary school.



TABLE V  
SUMMARY OF QUESTIONNAIRE

KIND OF FIRM	KIND OF WORK	NUM- BER EM- PLOYED	EDUCATION REQUIRED	IMPORTANCE OF WRITING*				QUALITY OF WRITING REGARDED AS ESSENTIAL†			QUALITY OF WRITING REGARDED AS DESIRABLE			IS SPEED IMPORTANT?
				1	2	3	4	Vertical	Medium Slant	Extreme Slant	Vertical	Medium Slant	Extreme Slant	
Correspondence school.....	Clerical.....	15	High school preferred	...	✓	...	...	...	90	...	...	90 and should be better	...	Yes
Department store..	Clerical and accounting	19	Grammar school	...	...	...	...	70	70	60	80	90	90	Yes
Mail-order house...	Stenography and book- keeping	500	High school desirable	...	✓	...	...	60	60	60	90	90	90	Yes
Correspondence school.....	Entry and bookkeeping	30	Grammar school	✓	...	...	...	...	90 or better	...	...	90 or better	...	Yes
Mail-order house...	File clerk ...	400	High school preferred	...	✓	...	...	60	60	50	80	80	80	Moderately
Department store, wholesale.....	General.....	.....	Grammar school Grammar school at least	...	...	✓	...	60	60	70	60	70	70	Yes
Packing company, railroad depart- ment.....	Clerical.....	90	Prefer high school	...	...	✓	...	60	...	...	...	...	90	Yes
Department store..	General office	82	Grammar school	✓	...	...	...	70	60	60	90	80	80	Yes
Mail-order house...	Addressing ...	200	Common school	✓	...	...	...	...	80	70	...	90	90	Yes
Correspondence school.....	Addressing ...	75	Common school	✓	...	...	...	70	...	...	...	90	...	Yes



As may be seen from the column which is headed "Education Required," all pupils who have finished the elementary school may enter the positions which are included in this table, although in a number of cases it is stated that high-school education is preferred. The positions which are represented in the table were chosen because it was thought that they would be typical of positions in which handwriting is an important qualification. That this is the case may be seen from the results in the column headed "Importance of Writing." The results of this study, then, will apply to those positions or vocations in which handwriting is an important qualification. We may expect that in the majority of other positions handwriting would not be so important. An inspection of the figures in the table will show that the quality which is most frequently regarded as essential for candidates is that of 60 on the Ayres scale. However, the qualities of 80 and 90 are most commonly those which are designated as being important enough to enhance materially the chances of a candidate. It is a reasonable position to take that the standard set for the preparation of the child should be such that it exceeds the minimum essentials, and at least comes, in some degree, toward the maximum quality which would be of value to the pupil. The standard of 70 for the eighth grade is not high from the point of view of the demands of these kinds of work. The results expressed in the last column indicate that practically all of the employers of labor in cases in which handwriting is an important element regard speed as of importance. It was not thought practicable to attempt to obtain more definite statements regarding the degree of speed which is attainable, owing to the fact that the men to whom the questions were addressed would not in all probability be able to express their standards in more definite terms.

A further fact which should be considered in the determination of this question is the number of children who will find it necessary or advantageous to possess the degree of skill which is to be adopted as a standard. To throw some light on this matter we may consider both the future educational and the future vocational careers of elementary-school pupils. Professor Strayer, in his article on retardation, in the *Cyclopedia of Education*, estimates that 35 per cent of the school population reach the high school. A fluent and legible style of writing will be very advantageous to these pupils in their school work. In fact, they will find it desirable to write more rapidly than 90 letters a minute and

the quality of their writing may be expected to deteriorate rather than to improve, unless they receive additional drill.

TABLE VI

VOCATIONAL DISTRIBUTION OF THE FATHERS OF ELEMENTARY-SCHOOL CHILDREN

Unskilled laborers . . . . .	4 per cent
Semi-skilled laborers and machine operatives . . . . .	22 "
Artisans and industrial foremen . . . . .	40 "
Clerks and salesmen . . . . .	9 "
Managers, superintendents, and proprietors . . . . .	21 "
Professional and financial . . . . .	4 "

Light is thrown on the question as to the number of elementary-school graduates who will require a fluent and legible style of writing in their vocations by a table which Dr. Ayres gives<sup>1</sup> showing the vocational distribution of the fathers of elementary-school children (see Table VI). It seems clear that the members of the last three groups, which comprise 34 per cent of all, will find it to advantage to possess the degree of skill attained by the upper half of the schools. A considerable number of the artisans and industrial foremen also make large use of writing. If we add half of these to the last three groups, we get 54 per cent.

There is of course a large duplication between the two groups, those who go to high school and those who have use for an efficient writing habit in their vocations. But some of the latter do not go to high school, and it is probably safe to increase the percentage of those who are affected to something over 60 per cent of the population. This 60 per cent of the population who will need to possess an efficient writing habit includes practically all who complete the eighth grade, since the percentage of the pupils who complete the grades is the same—60 per cent, and since nearly all those in the occupational groups which have been included will have completed the elementary school. Therefore practically all of those who would be required to reach the proposed standard will have need for it in their later life.

The foregoing facts and discussion have been brought together into a standard which is expressed in Table VII and in Chart V. The upper

<sup>1</sup> L. P. Ayres, "Some Factors Affecting Industrial Education," *Elementary School Teacher*, XIV (1913), 313-18.

line in the chart shows the standard for quality, which is to be read by referring to the figures in the left margin; and the lower line represents the standard for speed, which is to be read by reference to figures in the right margin. The standards are based directly upon the results of the average of the upper half of the schools. The only important modification is that in speed from the sixth to the eighth grades. The justification for this modification has already been suggested. In brief,

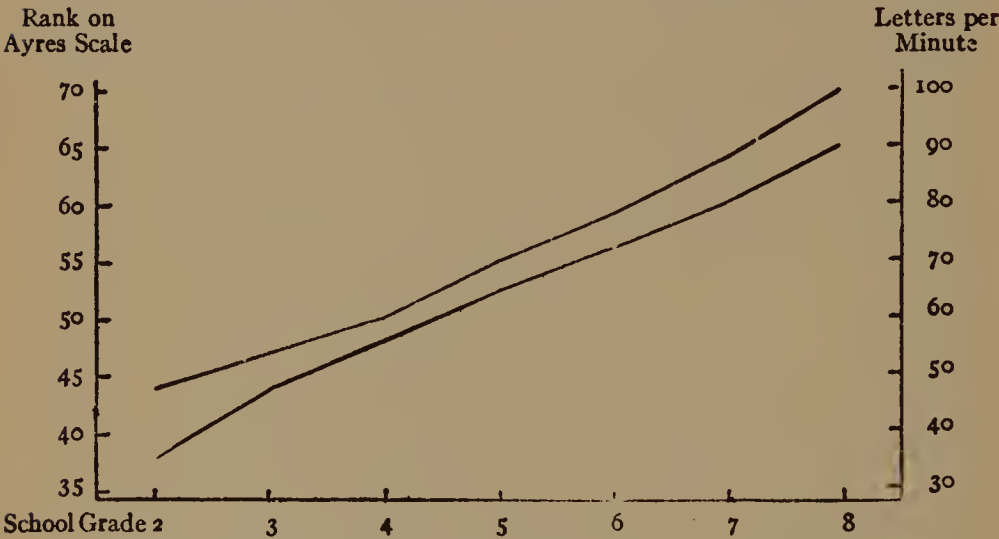


CHART V.—Proposed standard for quality (upper line) and speed (lower line).

TABLE VII  
PROPOSED STANDARD FOR QUALITY AND SPEED

	SCHOOL GRADE						
	II	III	IV	V	VI	VII	VIII
Quality.....	44	47	50	55	59	64	70
Speed.....	36	48	56	65	72	80	90

it is this: While the diminution in the rate of increase from the fifth grade on is a natural one, and is to be explained by the lower rate of increase in motor ability at this time, yet the efficiency which has been attained in a number of schools shows that the drop is not necessary. Furthermore, the actual speed which is attained even in the upper half



of the schools by the time of the eighth grade is lower than it should be. Less than 80 letters a minute is slow writing, and the standard which is laid down, of 90 letters per minute, is well within the bounds of reason. The only other modifications which are made consist in slight changes of the averages found in order to make the numbers round numbers, and to smooth very slight irregularities in the curves. The greatest change consisted in slightly raising the standard in quality for the eighth grade, so as to bring it up to 70 instead of  $67\frac{8}{10}$ . This maintains an even progress; whereas the results from the averages show a drop at the eighth grade.

The data which have been presented indicate that this standard can be attained with an expenditure of time of not over 75 minutes a week. The writer is convinced on the basis also of some of the data that it could be attained generally, as it is in some cases, by the expenditure of a much shorter amount of time. When the most efficient methods are employed it will probably be found that the expenditure of from ten to fifteen minutes in the intermediate grades suffices to fix the handwriting habit in its main outline; and that the expenditure of a small amount of time in the upper grades will maintain the efficiency of the habit and increase it by the amount of progress which is represented in the standard. The consideration of these matters, however, is not a part of our task. A fuller discussion of them may be deferred to some other occasion.

## CHAPTER VI

### SPELLING

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#### MINIMUM CONTENT

Many attempts, unintelligent, or at least haphazard and unscientific, have been made to abridge the spelling course. Teachers have tried to select words from the different subjects in the curriculum or from the spelling texts. While such effort is commendable, it has failed to secure good results because of the fallibility of individual opinion regarding the most important material.

Even among teachers of the same grade there is wide difference of opinion as to what the essential minimum should be. An attempt on the part of the writer to make a graded vocabulary for the elementary school secured words of much too great a range of difficulty for each grade. Only consistent and extensive investigations under skilled supervision will secure adequate results.

The work of several investigators in this field is very commendable and should be more widely known to school men.

Only a few spelling books can be mentioned. *Hicks's Champion Spelling Book*, which has been used so successfully in the Cleveland, Ohio, public schools, is based on the excellent spelling instruction and the experience of teachers in that system. It presents a minimum of ten words per day, two of which are "dominants," and is arranged in such a way that each word is reviewed five times in two years after it is learned, an important factor in the learning process.

The *Bailey-Manley Spelling Book* contains a comparatively small vocabulary chosen with great care; it is an outgrowth of actual teaching experience. It recommends the use of words which every child should know, supplemented by a list based on class or individual needs. Nine words a week are assigned for the second grade, with a gradual increase as the pupils advance.

Dr. Rice's speller has some good features. It attempts to grade words according to difficulty and to give the most common ones precedence; uncommon, i.e., technical terms, are to be taught incidentally. He has attempted to abridge the text by omitting words which "spell themselves," "derivative words formed according to rule," and words whose spelling the pupils learn by the time their introduction is necessary. The number of words per lesson is high; fifteen to twenty for the first three years, and fifteen to twenty-four for the fourth through the eighth.

Professor Jones, of the University of South Dakota, has summarized the results of several years' work in his *Concrete Examination of the Material of English Spelling*\* and *The Child's Own Spelling Book*.<sup>8</sup> The content of these two works was established by an examination of over fifteen million words in the themes of 1,050 school children. The list of 4,532 words used in the speller is not a minimum one because it includes for each grade all words which were used by at least 2 per cent of the pupils of the grade. The following table shows the distribution of words and also the average vocabularies by grades:

	GRADE						
	II	III	IV	V	VI	VII	VIII
Distribution.....	1,927	2,396	2,838	3,270	3,695	4,114	4,532
Average vocabulary.....	521	908	1,235	1,489	1,710	1,926	2,135

Professor Jones says that the most troublesome words are found in the second- and third-grade lists and "faithfully reappear throughout the subsequent years. Over nine-tenths of all words misspelled by the 1,050 grade-students are found in these two lists." The writer has checked up the "one hundred spelling demons" of the Jones list, and finds that ninety-two of them are included in the second-grade list, four in the third, and four in the fourth. This shows where a great deal of the emphasis in spelling teaching should be placed.

The list omits many common names; it includes words having a purely sectional significance; those which are just coming into use, such as "aeroplane"; and those which are disappearing, as "surrey" and "phaeton." This suggests the need of a constant, careful revision of

\* Numbers refer to bibliography.

spelling material with a view to giving the child only such words to learn as he will actually use.

Professor Jones's study shows that the child's writing vocabulary is very small as compared with the whole vocabulary. Dr. Ayres's study of *The Spelling Vocabularies of Personal and Business Letters*<sup>1</sup> supports this idea; in fact his investigation found that only 542 different words were used in the greater part of the correspondence from twelve different sources differing as widely as love letters and business letters.

The learning of the words of the writing vocabulary should be required as the pupil advances through the grades. What we need is to develop a spelling consciousness that will make the pupil more awake to orthographical errors, and a conscience that will not permit him to leave a word until he is sure that it is correct. Probably such a condition would result, not only in better spelling, but also in better composition.

Mr. Homer J. Smith<sup>4</sup> has three lists of 1,138 spontaneously used words chosen from 75,000 words in the themes of Madison, Wisconsin, elementary-school pupils, Grades III—VIII. The first list includes words used by pupils in all of the grades; the second of words used by at least three; and the third of words used in two different grades. It can be seen that the basis of selection is universality of use. While the list looks good, it would be more usable if carefully graded. It omits personal, demonstrative, and possessive pronouns; numerals; about thirty common prepositions, conjunctions, verbs, and adverbs; and local proper names. These omissions constitute a weakness except for the local names, which need not be included except in a purely provincial list.

Chancellor's list<sup>3</sup> of 1,020 words, compiled from his correspondence, is, to quote the author, composed largely of "words that constitute the machinery of our language." It contains no proper names or "words for spelling matches."

Mr. R. C. Eldridge,<sup>6</sup> a factory manager of Niagara Falls, New York, has compiled a list of 6,002 words, together with their frequencies, from two pages of each of four Buffalo, New York, daily papers. The list was prepared to serve as the basis for a "universal vocabulary"; it is of great value as a spelling list, although somewhat specialized. According to Mr. Eldridge the first 250 words are found to constitute the chief English sentence-forming words. "The first 750 words in List 5 [the

compiled list], with their repetitions, constitute more than three-fourths of all the words on the eight pages from which they have been drawn, and probably a large part of these words would be found in nearly the same proportion in any English conversation or printed matter."

Appended to Mr. Eldridge's work is a list prepared by Rev. J. Knowles, of London, England, of "the 353 most frequently occurring words in an aggregate of 100,000 words, made from passages of the English Bible and various authors, arranged in the order of their commonness and showing how many times each of the 353 appears."

Another graded list for Grades III-VII, inclusive, is a compilation published in the Chico, California, State Normal School *Bulletin No. 7*, "Common Essentials in Spelling,"<sup>14</sup> prepared by Messrs. C. K. Studley and Allison Ware. This work includes the 542 words of Dr. Ayres's study;<sup>1</sup> it makes use of an 840-word list—each word was used more than twice in 19,288 words of correspondence examined—prepared by Miss Effie McFadden and Dr. Frederick Burk, of the San Francisco, California, State Normal School. Finally, the authors examined 200,000 words in children's themes in which "3,459 different words or different forms of the same words" were used. "Words not clearly of common written use in life were omitted in the final compilation." The total number is 3,470—over one thousand fewer than are found in *The Child's Own Speller*.

Mr. Algar Woolfolk in an unpublished thesis<sup>19</sup> gives a list of 411 words which "are suitable for incorporation in a text or course of study." The words—only those misspelled four or more times are given—were taken from a miscellaneous set of compositions "consisting of one-third letters" written by pupils in Grades III-VIII, inclusive, of the Horace Mann School, and the public schools of Newark, New Jersey, and Richmond, Virginia. It is valuable because (1) it contains common words and (2) shows the relative frequency of misspellings by grades.

None of the lists is claimed to be a "minimum list"; any one of them is very suggestive as a starting-point. Dr. Ayres's 542 words constitute about seven-eighths of all the words used in the correspondence investigated; the first 750 words of Mr. Eldridge's list constitute, in the author's opinion, about three-fourths of all the words commonly used; Professor Jones's second-grade list "contains the very useful words of all the grades";<sup>7</sup> in the list prepared by Dr. Burk and Miss McFadden only 840 of a total of 6,916 words were found to be used



more than twice, and these "included and verified most of the words of the Ayres list."<sup>13</sup>

On the basis of investigation up to the present time, the writer feels justified in placing the minimum content in the elementary spelling course at from 750 to 1,000 words. Considerable checking of lists against each other, further study of the frequency of words used in children's written work, and a careful trying out of the resulting list in its tentative form will be necessary before any very definite conclusion can be drawn.

Some of the words common to all of the lists offer no real difficulty and might be omitted from a "minimum" list; doubtless further investigation would show some additions to be necessary. Just what changes should be made can be determined only by testing the ability of pupils in successive grades to spell the words and use them in sentences. The words left after such a revision would constitute a fairly reliable minimum.

The writer has examined over 250 city-school reports and courses of study to find to what extent they consider the matter of content. The great majority of them treat the subject in a purely perfunctory way, stating the amount that is to be done each month or year in lessons or pages of a certain text. About sixty of the courses give somewhat more definite information, but few offer anything of real value.

Four courses definitely recommend as high as ten to fifteen words per day; five say that from two to five should be learned; two require from six to twelve. Three courses give instructions to use the adopted text with certain specified omissions.

Of the few cities giving definite numbers of words as the requirement for the whole course, Berkeley, California (1914-15), recommends a minimum of 4,700 for Grades II-VI; New York City<sup>15</sup> recommends 3,800 for Grades II-VIII; Richmond, Virginia (1914), 3,250 for Grades II A-VII B; Bath, Maine (1914), 9,300 for Grades I-VIII.

A publication, *Teaching of Spelling*, issued by the New Jersey Department of Public Instruction, recommends four or five words for a primary lesson, five to seven for an intermediate grade, and not more than ten for a grammar grade. Triweekly lessons for six years on this plan, it is maintained, would give the working vocabulary of a well-educated adult and leave ample time for review. This would give approximately 4,000 words.

Lists of words for Grades I and II are given in the courses of Dover, New Hampshire (1912); Passaic, New Jersey (1912); Augusta, Georgia (1913); Albert Lea, Minnesota (1914); Omaha, Nebraska (1911); Milwaukee, Wisconsin (1913); and Toledo, Ohio (1908-11). Dallas, Texas (1912-14), and Des Moines, Iowa (1909), give lists for the second grade. Orange, New Jersey (1908), and Owensboro, Kentucky (1912-13), give lists for the first grade. Cincinnati, Ohio (1912), has lists for the first, second, and fifth grades. The Johnstown, Pennsylvania, *Report and Manual* (1914) mentions a spelling book compiled by teachers and supervisors which provides two words daily for Grades I-IV, and five daily for Grades V-VIII.

Doubtless there are other lists, but they are not available for the purposes of this paper. Certain definite standards for the selection of spelling words are necessary. They should be symbolical of the experiences of the children in and out of school; they should be words which the average adult uses; they should be the short, simple, frequently used, and perplexing words, such as "their" and "there," "whose" and "who's." Various texts should contribute to the list. Words misspelled by a number of the pupils in a class should be included. Individual pupils should keep lists of words which cause them difficulty. These are substantially the standards set forth in *Standards in Spelling*,<sup>15</sup> a study by Associate Superintendent Gustave Straubenmuller, of New York City. A number of schools are making use of these or similar standards in the selection of their spelling material.

The function of spelling is to teach children how to spell and use in an accurate way the words which are commonly met with in life and to form such habits of study that new words will be learned as the need for them arises. In the preparation of a spelling list the function which it is to subserve should be kept clearly in mind. Dr. Ayres found that of the 414 words used in the famous National Education Association spelling tests of 1908, only 125 were included in the letters analyzed for his study, while not one of the remaining 289 appeared even once. This at least suggests the futility of preparing a useful list of spelling words without careful and extensive study of the needs of the common people.

#### MINIMUM TIME

Very little of value concerning this topic can be gleaned from pedagogical literature. Our consideration of the topic will necessarily involve a discussion of method, with which it is so intimately associated.

The first investigator of note was Dr. J. M. Rice,<sup>13</sup> who concluded that more than fifteen minutes per day devoted to spelling was absolutely wasted. Dr. Rice's experiments were too crudely empirical to receive serious attention from scientific investigators, but he did much to call attention to the spelling problem. We can have little disagreement with his general conclusion regarding time. The law of diminishing returns would operate here; on account of fatigue, the amount of time spent above a certain limit would be out of all proportion to the results obtained.

Dr. Cornman's experiments<sup>14</sup> in Philadelphia to determine the relative merits of the "incidental" and "drill" methods of teaching spelling led him to conclude that time devoted to drill "bears no discoverable relation to the result."

Mr. Wallin's study<sup>15</sup> of conditions in the Cleveland, Ohio, schools, while not concerning itself directly with the problem of time, showed "on time" pupils to be superior to "accelerated" or "retarded" pupils. He calls attention to three steps in the learning process whose use cannot fail to save time: (1) a clear image of the word, visual, auditory, or motor, should be formed; (2) enough repetition in the child's own memory type should be had to fix the word in mind; (3) the procedure in one and two should be so effective that the word can be reproduced automatically, when the proper stimulus arises, with the minimum thought as to sequence of letters. He says: "Habits perhaps can never be made as stable as reflexes. Nevertheless it can be confidently affirmed that those habits which have been thoroughly ingrained will resist decay longer than those which have been only partially solidified or which have been loosely organized by slipshod methods. A completely formed habit is relatively if not absolutely stable." Stable habits mean economy of time.

Let us consider briefly what city-school reports and courses of study have to offer on our problem. Only forty out of several hundred examined give time apportionments for the several elementary-school subjects. Determination of the time devoted to spelling is complicated by several factors not easily controlled: (1) In the primary grades there is seldom anything to indicate whether the study of phonics occupies a part of the spelling period, or whether spelling is taught with reading. (2) There is little to show whether the time is devoted entirely to recitation, or to recitation and study. (3) Very few courses indicate whether spelling is

to be studied during special periods, or out of school. (4) The fact that courses of study are not issued yearly prevents any very definite conclusions regarding the relative amounts of time devoted to spelling in the past and present.

In the "early days" the time devoted to spelling in Pictou, Nova Scotia, ranged from 74 per cent of the total time for the primary grades to 25 per cent for the grammar grades.<sup>21</sup> This condition was probably fairly typical for the schools of that period. Multiplication of courses has necessitated a readjustment. In 1877-78, 8.47 per cent of the school time in Cleveland, Ohio, was devoted to spelling.<sup>20</sup> During the year 1907-8, the elementary schools of Boston, New York, Chicago, Rochester, Cincinnati, Indianapolis, St. Louis, Milwaukee, Kansas City, and San Francisco devoted an average of 7.22 per cent<sup>20</sup> of their time to spelling. Cleveland's time for the same year was 5.94 per cent.<sup>20</sup> Cleveland's record has become proverbial; the intensive study of only two new words per day makes possible a high degree of efficiency with a minimum outlay of time.

The average time devoted to spelling in eleven other, smaller, cities at practically the same time (1907-9) constituted 5.05 per cent of the total time for all subjects; the percentage for the period 1910-12 for thirteen school systems, including Cincinnati, Cleveland, and San Francisco, mentioned above, was 6.96; for a group of nineteen cities (1913-15), including one of the "eleven" group and three of the "thirteen" group, the percentage was 5.58. Figures showing the percentage of time devoted to spelling over any considerable period are not available for a large number of cities. The few that can be found simply confirm what the above figures show, that the spelling time is gradually being reduced.

#### EXPERIMENTAL INVESTIGATIONS OF METHODS

A series of experiments<sup>22</sup> was performed by Mr. H. C. Pearson in the Horace Mann School to determine the relative efficiency of class and independent methods of study in improving the child's attention, ability to select the points which need emphasis in study, and drill technique. The former method was proved much better from the standpoint of time and efficiency.

Another experiment<sup>20</sup> of Mr. Pearson's, repeated in one of the Montclair, New Jersey, schools, to determine the relative efficiency of



"together" and "separate" methods of teaching homonyms, proved the former to be more effective on the whole.<sup>1</sup>

The idea of grouping words, i.e., names of rivers, trees, cities, and the like, to facilitate learning, has been adopted by many spellers. While such a scheme may be an aid to learning the names of the associated things, it cannot be of great value as an aid to learning spelling.

Many words in the English language can be classified roughly in *groups of similar spelling*. The remainder, which are exceptions to general rules, are amenable to special study. Wagner's study<sup>2</sup> of the benefits to be derived from grouping words according to similarities in spelling showed a decided advantage for the grouping method. Two divisions of the sixth grade studied a list of words after their customary fashion. The only difference in the procedure of the teacher lay in the grouping of such words as "lineal," "lineament," "linear," "lineage," for one division. These pupils raised their average grade from 68.36 per cent in the preliminary test to 97.14 per cent in the final, a gain of 28.78 per cent. The other division raised its average from 73.25 per cent to 93.6 per cent, an increase of 20.35 per cent.

In 1912 the writer performed an experiment<sup>3</sup> to determine the value of "spelling the word through" as an aid to learning. Two divisions of the fifth grade studied the same list. Conditions as to time, length of period, and the like were the same for both divisions. For one, emphasis was placed on observing carefully the order of letters while studying. Preliminary and final tests given to both divisions showed an advance from 50.55 per cent to 83.39 per cent, or an average gain of 32.84 per cent for the division working under the usual conditions. The other division advanced from 48.58 per cent to 89.14 per cent, an average gain of 40.56 per cent.

A study of all the available experimental material in spelling shows that a consistent use of some definite method secures better results than the so often haphazard methods of many teachers. It simply confirms the opinion of the writer that a study of the question of time which does not consider method is inadequate.

#### SCALES FOR MEASURING SPELLING ABILITY

Some sort of a measure for spelling ability would result in economy of time by making possible a more accurate diagnosis of the situation and more intelligent methods of treatment. Dr. Buckingham has fur-



nished a scale.\* At first it made use of two lists, each containing twenty-five carefully selected words "which showed reasonably regular increase in correctness of spelling for successive grades." By means of this scale a comparison can be made of individuals, grades, schools, and systems. By the use of groups of equally difficult words, progress over a period of time can be measured. Dr. Buckingham has extended his list to about 500 words and plans to have 1,000 carefully evaluated and classified words for Grades II-VIII, inclusive. Such an extension will make the scale infinitely more useful.

The Division of Education of the Russell Sage Foundation "has conducted studies to discover the 1,000 words most commonly used in writing and it has made these words into spelling lists with which children in nearly 100 American cities have been tested."<sup>10</sup> These words will doubtless prove valuable in the preparation of a "minimum" list. Dr. Ayres has used them as a standard by means of which he has made a practical test of the spelling ability of Springfield, Illinois, elementary-school children. In this city 3,612 pupils in all grades averaged 70 per cent correct in spelling words which were spelled correctly by 70 per cent of the pupils in the same grades of the cities mentioned before.

#### CONCLUSIONS

Any conclusions must necessarily be merely tentative, because of the inadequate material at hand and the lack of thorough testing of results. It can be confidently asserted that spelling texts furnish neither a minimum nor, for the most part, a satisfactory list of words. The two texts based on a study of children's themes and on children's themes plus business letters seem most adequate.

Lists of words prepared by Ayres, Chancellor, Eldridge, Knowles, Jones, Smith, Woolfolk, and Studley and Ware afford material from a variety of sources. The words which they agree on might be taken, temporarily, as the minimum content in spelling. A more thorough study of children's writing vocabularies is needed to show (1) what words presenting "no difficulty" may be omitted, and (2) what important words should be added. Each word must be carefully graded; it should be placed in any grade list only when a study of the conditions underlying its use seem to justify its position.

The fact that there are only thirteen city lists, in no case for all grades and none "minimum," shows the need of a work such as is indicated here.

As to time, we know very little. The tendency in the past has been to devote too much time to spelling, because of poor organization of material and inefficient methods of instruction. The problem of time is inseparable from that of method. The figures available show that the time devoted to spelling in city-school systems has been gradually reduced until now 82 minutes per week, or 5.5 per cent of the total, is devoted to spelling.

One investigator has prepared, and another is preparing, graded lists which will be very suggestive as to content, and which may be used as standards for the measurement of spelling efficiency, and for finding how the time devoted to spelling has functioned in securing adequate results.

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## CHAPTER VII

### THE ESSENTIALS OF COMPOSITION AND GRAMMAR

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and

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#### INTRODUCTION

*Purpose of the paper.*—In the present state of knowledge no one is justified in stating with any attempt at completeness what should constitute the essential as contrasted with the optional subject-matter for the study of English composition and English grammar in the elementary school. The topic is as difficult as it is important.

The present paper is a survey of progress. It reviews the discussions, investigations, and reports in this field and offers a summary of conclusions that seem fairly well established. Much remains to be done. Those who wish to press the investigation further will find in the experience of others suggestions as to problems and methods. Meanwhile, course-makers and writers of books should consider the possibility of omitting much traditional material and of placing greater emphasis upon certain activities that are highly necessary in preparation for life and that are at the same time fitted to assist the growth of children.

*A general view of the problem.*—One reason why economy in English proves difficult is because language forms so intimate a part of life. Improvement in it involves the whole round of home and school interests. Composition is, in a sense, a phase of all study and of all human relationships, rather than a subject to be set apart on the school program for a certain hour in the day. Mastery of it is, therefore, in large measure dependent upon the entire organization and management of the school. Nor can we stop with the school. In the matter of speech—and indirectly writing is deeply affected—the influence of the home is paramount. Other considerations aside, the home has six years the start of the school, the six most impressionable years. Hence the teacher of language, instead of introducing children to a new interest, is called upon to take stock of the language habits already acquired, strengthen and improve

these as she can, and strive to keep the child's power of expression abreast of his ideas. In the end the language he speaks will be mainly the language he has heard.

It is not likely that the time devoted to language in the elementary school can safely be cut down. We must make vast improvement, at any rate, before this will be justified. At present classes are too large to permit of proper individual instruction, methods of teaching and of co-operation are largely ineffective because unvaried and untested, and the work of each year is so ill defined that emphasis is scattered and fails to strike home. What we must aim at is (1) to discover standards which will enable us to decide what to include and what to omit from the language course; (2) to organize and present the chosen material so as to give it continuity, proportion, and a sense of realness; (3) to set up definite goals of achievement, which will stimulate to endeavor but not unduly narrow the path; and (4) to work out measurements which will enable both teacher and principal to know the true state of the pupils' minds.

Present practices are justified mainly by tradition. "It has been so." The very conception of course of study is in need of overhauling. The term means generally an outline of certain formal knowledge to be acquired rather than a series of related experiences leading to the control of consciously prized values. The English course began with a grammar for foreigners modeled on the Latin, was given a new direction by Lindley Murray, but still consists largely of "exercises" made with scissors and paste. How hazy we are on the subject is attested by the fact that language-books, with few exceptions, are a hodgepodge of composition lessons, spelling, forms to avoid, pronunciation, voice-training, picture-study, poetry, scraps of classic prose, lessons in other school subjects, and much formal grammar. It would be a positive gain if the really strong teacher could have for a while the help of a multigraph and be left to work out her own salvation without the interference of the irrelevant book.

#### THE EDUCATIONAL BASIS

Economy in language-training is an educational problem. It must be studied in the light of general educational principles. Before passing to the survey of actual investigations, let us pause long enough to call to mind some of the more significant attempts to analyze the nature and



purpose of school work with reference to possible omissions from the course and better organization of effort.

One of the most suggestive statements of the problem of economy is that made by Frank M. McMurry, of Teachers College, Columbia University, at the meeting of the National Education Association in 1904.<sup>1</sup> He proposes to eliminate:

1. Whatever cannot be shown to have a plain relation to some real need of life, whether it be aesthetic, ethical, or utilitarian in the narrower sense.
2. Whatever is not reasonably within the child's comprehension.
3. Whatever is unlikely to appeal to his interest; unless it is positively demanded for the first very weighty reason.
4. Whatever topics and details are so isolated or irrelevant that they fail to be a part of any series or chain of ideas, and therefore fail to be necessary for the appreciation of any large point; this standard, however, not to apply to the three R's and spelling.

He would secure economy by judicious selection of topics and details. Teachers must learn (1) to bring subject-matter under large but definite headings, (2) to select typical subtopics, and (3) to discover in each subject leading questions that need to be answered. What is required is better organization of each subject.

Another highly suggestive discussion of the problem of selection and organization of subject-matter is that contributed by A. Duncan Yocum, of the University of Pennsylvania, to the program of the Department of Superintendence at Philadelphia in 1913. Mr. Yocum seeks a test of the relative worth of details in the course of study that shall be both universal and practicable. "To be universal it must measure usefulness, not only from the standpoint of direct preparation for life or social efficiency, including specialization and culture, but also from that of general knowledge and mental development." Here Mr. Yocum seems to favor two of the standards which Mr. McMurry rejects. He would guard these, however, by reducing the test to a "naked definiteness" that would make selection certain through an analysis of the educational aim and the educative process.

This he proceeds to do by dividing all school discipline into phases of formal self-activity, the values of which are to be measured in terms of relationships, and concludes that—

<sup>1</sup> Frank M. McMurry, "What Omissions Are Advisable in the Present Course of Study, and What Should Be the Basis for the Same," *Proceedings of the National Education Association*, 1904.

those details are relatively most useful in their furtherance either of a specific phase of the educational aim or of the formal phases of mental development: (1) which are most many-sided in their relationships; (2) which are most frequent in their recurrence; (3) which inherently make the strongest sensational or emotional appeal that is useful. Relative many-sidedness, recurrence, and emotional appeal should determine the educational content. But to relative usefulness must be added immediacy of many-sidedness, recurrence, and emotional appeal, in order to determine the point at which the most useful details shall first be taught.

Such a test, Mr. Yocum holds, furnishes a definite and mathematical means of expressing value. The number and recurrence of relationships can be counted and the degree of emotional appeal estimated. This, however, will rarely be necessary. It will usually be sufficient to determine what details must be included in the general course of study and which of these must be permanently mastered. Once such details have been determined they must, in the interests of democracy, be thoroughly taught to all pupils.

It is well to take up a survey of specific investigations and formulations of standards and tests with these larger views of our problem fresh in mind. Otherwise our enthusiasm for definiteness and the promise of order where there is now much confusion may mar our perspective. A ready-made course of study on a quantitative basis which teachers could follow without thought would be no less a curse because it had a new name. Behind the machinery of economy must stand far-reaching and rational ideals.

#### A SURVEY OF INVESTIGATIONS

##### I. TESTS AND SCALES IN COMPOSITION

1. *The "Tatters" report.*—One of the earliest attempts to measure the effectiveness of school work in English was made in Chicago in 1905 under the direction of Mr. E. G. Cooley, then superintendent of city schools.<sup>1</sup> Somewhat persistent criticism of the results of the grade work in grammar, composition, and spelling led Mr. Cooley to undertake a test of the pupils in the seventh grade. He appointed a committee of principals and teachers, with the writer as chairman, to devise a test and examine the results. The outcome was distinctly favorable so far as the current criticisms were concerned, but not flattering in

<sup>1</sup> Described in the *Chicago Board of Education Bulletin* of March 28, 1906.

respect to other matters which seemed to the committee of greater importance.

The procedure was as follows: A brief story entitled "Tatters" was taken from the *Youth's Companion*, duplicated, and sent to each school in the city. The directions were:

(1) The story is to be used as an exercise in reading and reproduction. Time, one hour. No knowledge of the story is to come to the pupils previous to the time of the exercise.

(2) The story is to be read to the class by the teacher—seven minutes. The story is then to be read silently by the pupils—five minutes. After the story leaflets have been collected, the pupils will silently recall the story—three minutes. The pupils will then write the story—forty-five minutes. Collect the papers promptly.

(3) The teachers will mark the papers and afterward the principal will review the marking. In case he should differ as to any marks, he shall consult the teacher and reach an agreement.

There followed an outline of the main incidents of the story and suggestions as to what would constitute excellence to the degrees of 85, 95, and 100 per cent.

The examining committee prepared an outline to guide each member in reading and reporting upon a portion of the papers. The main points in this were (1) external form, (2) thought and composition, (3) vocabulary and sentence structure, (4) individuality, and (5) general suggestions. The complete report of the committee was arranged under these heads and was accompanied by typical compositions representing different degrees of excellence—a rough scale. There was no attempt at exactness, but the qualities of composition to be sought were definitely indicated. It remained for Professors Thorndike and Hillegas to lead the way in the making of composition scales by means of a mathematical treatment of the rankings of certain papers by several competent judges.

2. *The Hillegas-Thorndike scale*.—"The Hillegas Scale for the Measurement of Quality in Composition by Young People" is now widely known,<sup>1</sup> and hence no description of it is necessary. It should be remarked concerning it, however, that such a scale is intended to provide

<sup>1</sup> Milo B. Hillegas, "A Scale for the Measurement of Quality in English Composition by Young People," *Teachers College Record*, XIII, No. 4, September, 1912.

a fixed objective standard. It does not indicate what may be expected at any particular point in the school course. Supposing the scale to be a means of just estimate of excellence in composition, we should still be in doubt as to whether a boy in fifth grade ought to be expected to write a composition as good as some particular example of the Hillegas scale, and if so whether on first attempt or after careful revision. More serious still is the fact that this scale does not take into account the type of writing in each case as determined by the purpose in view. Description, for example, appears in comparison with narrative. Moreover, there is no attempt to distinguish between mere correctness—observance of established usage in grammar and so forth—and style, or the reflection of personality in shaping language so as to produce a given effect.

The practical value of the Hillegas scale is very doubtful. Principal Franklin W. Johnson, of the University High School in Chicago, made a test of it in 1912.<sup>1</sup> He submitted eight themes of high-school pupils, two of which were written by pupils with very inadequate elementary-school preparation, to forty-seven teachers of English composition in high schools, colleges, and normal schools, and also to a class of graduate students who were studying educational tests, with the request that each grade the papers with the help of the Hillegas scale. The maximum variation ranged from 18 to 69 and there was clearly no agreement as to the value of any composition. Mr. Johnson points out in his account of the experiment that the Hillegas scale represents a set of average judgments, while there is no such thing really as an average judgment. He also calls attention to the fact that the Hillegas scale takes no account of content. The examples included in it are singularly lacking in thought and originality. Two scales must be arranged, he thinks, one of which will assist in determining the value of form and the other of content.

Mr. Johnson's conclusions seem to be completely upheld by a far more exhaustive series of trials of the scale which are reported by Frederick J. Kelley in *Teachers College, Columbia University, Contributions to Education*, No. 66. He reduced the Hillegas scale and the ordinary

<sup>1</sup> Franklin W. Johnson, "The Hillegas-Thorndike Scale for the Measurement of Quality in English Composition by Young People," *School Review*, XXI, No. 1, January, 1913.



percentage system to common terms and found that in the hands of novices the latter shows less variation than the former. He says, however, that it remains to be shown whether considerable practice would lead to greater satisfaction in using the scale.

Soon after its publication a trial of the Hillegas scale was made by a number of teachers in Boston and neighboring towns under the direction of William S. Learned, Joseph Lee Fellow for Research at Harvard University.

A set of fifty papers, written by elementary, grammar, and high-school pupils, was graded subjectively by five elementary-school teachers, five grammar-school teachers, and five high-school teachers. The markers were simply asked to rate the relative value of each paper as a bit of prose composition and to designate this subjective rating by a percentage mark ranging according to judgment anywhere from 0 to 100 per cent. Three weeks later these same fifteen judges, with the Hillegas scale before them, regraded the papers, trying to match each with an example in the scale.<sup>1</sup>

The results of the experiment may be summarized as follows: The average extreme variation on the first marking was 58 per cent; on the second, 44 per cent. The variation of the nine judgments nearest the median was in the first instance from 10 per cent to 43 per cent, and in the second instance from 7 per cent to 32 per cent. The markings were, therefore, more uniform on the second round. It is contended, however, that this was due in large measure to the fact that the teachers came to the second marking with the feeling that extreme variation is undesirable and with greater unanimity of judgment because of the conference which resulted from the first marking. It was found, moreover, almost impossible to compare compositions by elementary-school children with the artificial and bookish samples in the scale. As one teacher said, the tendency was to throw the composition at the middle of the scale in despair of doing anything better.

3. *The Harvard-Newton scale.*—Stimulated by their experience with the Hillegas scale, the teachers and principals of Newton, Massachusetts, at the suggestion of Mr. Frank E. Spaulding, at that time their superintendent, undertook the formation of a scale which should be as free as possible from the defects of those of Hillegas and Thorndike. Working

<sup>1</sup> Charles Swain Thomas, *Leaflet of the New England Association of Teachers of English*, No. 104, January, 1913.



under the direction of Frank W. Ballou, who succeeded Mr. Learned as special research student in the department of education at Harvard University, they gathered typical compositions in description, exposition, argument, and narrative, and through consensus obtained by a scheme which included both grading and ranking in order of relative merit they selected six compositions of each type, representing degrees of excellence ranging from very poor, or about 45 per cent, to very good, or about 95 per cent.<sup>1</sup> These, it will be noted, were the work of eighth-grade children in various schools. When the scale was completed it was tried in practice by principals and teachers in Arlington and Boston.

A particularly useful feature of this scale is the appending to each composition of remarks by the committee upon its merits and demerits, and also of a comparison with the one just above or just below it. This makes the basis of judgment clear and enables the user of the scale to compare other compositions with it so as to give due weight to certain qualities or defects without ignoring others.

What the teachers and principals of Newton have done other teachers and principals should undertake. Not the least valuable feature of such an enterprise is the necessary conference for comparison of standards. In Newton the teachers of English in the high school participated in the work, thus coming directly in contact with the teachers in the grades. The result could not be other than enlightening to all. Even if the mathematical exactness with which the Harvard-Newton scale was worked out seems impossible because of lack of expert assistance, nevertheless, any school may provide itself with a collection of compositions representing the work of every year, or even semester. Each composition should be accompanied by a succinct account of how it was created, as well as by comments upon both its merits and its defects; and there should be sufficient variety of such compositions, ranging in quality from poor to excellent, to represent all sorts of writing likely to be done in each year. These might, in many cases, be supplemented by means of stereographic, or even phonographic, records of oral compositions, and in this way accidental, haphazard, almost wholly personal standards for children's work in composition might be replaced by

<sup>1</sup> Frank W. Ballou, "Scales for the Measurement of Composition," *Harvard-Newton Bulletin*, No. 2, September, 1914.

impersonal, objective, rational standards, which would stimulate to well-balanced and definitely aimed composition-teaching.<sup>1</sup>

Scales would render more valuable such experiments as that in the use of oral work in composition which is about to be described, because it would warrant more confidence in the opinions of those observing the results of the experiment.

4. *The Illinois experiment.*—The Illinois Association of Teachers of English, at the annual meeting in Urbana in November, 1912, selected oral composition as the subject for investigation during the ensuing year.<sup>2</sup> It was proposed to test the truth of the following propositions:

- 1. Oral composition is in itself an important part of the English work of the high school.
- 2. Oral composition requires relatively less time from the teacher than does written composition.
- 3. Proficiency in oral composition carries over into written composition.

A committee under the leadership of Professor John M. Clapp, of Lake Forest College, arranged a course for the second semester of the ninth grade, which was to be taught in two ways: one class would have

<sup>1</sup> Such a collection of compositions is in process at the Chicago Normal College. The form used is the following:

EXAMPLES OF WRITTEN COMPOSITION

Grade.....	School.....	Date.....
HISTORY OF THE PAPERS:		
1. How the subject was found.....		
.....		
2. How the subject was worked up.....		
.....		
3. Conditions under which the writing was done.....		
.....		
4. Criticism, revision, rewriting, incidental instruction, assistance of any kind.....		
.....		
5. Additional information.....		
.....		

NOTE.—Papers of all sorts are desired. Please be very definite as to all the conditions leading up to and surrounding the writing, especially as to assistance given by the teacher. Let each pupil sign his name and state his age.

<sup>2</sup> John M. Clapp, "An Experimental Course in Freshman Composition for Illinois High Schools," *Bulletin of the Illinois Association of Teachers of English*, V, No. 4, January, 1913; "Report on the Experiment in English Composition," *ibid.*, VI, No. 5, February 15, 1914.

only written exercises; the other, a combination of two-thirds oral and one-third written. All classes taking either course were to be given the same written tests at the beginning, at the middle, and at the end of the semester. All the papers written by each class, including these tests, were to be forwarded to the committee in charge of the experiment, accompanied by a report from the teacher, stating as accurately as possible how much time he spent in preparation, in conference, and in correcting papers, and also his opinion as to the results of the experiment.

The outcome was decidedly favorable to the use of oral composition. "The sections taking the combined course were better at the end of the semester in thought—vigor, freedom, interest—than the others; they were better in point of grammatical and rhetorical structure; they were *no worse* in spelling and punctuation and better in handwriting—indeed, the writing sections showed marked degeneration in all matters of mechanics." Over half of the twenty-two schools which carried out the experiment in full reported greater improvement in the combination sections, while only two reported less improvement.

The association adopted the following recommendations of the committee: (1) That oral exercises be made a regular part of high-school English work throughout the course, in the proportion of two-thirds of oral work to one-third of written work in the first year, one-half of each in the second year, and one-third of oral work to two-thirds of written work in the third and fourth years; (2) that school authorities allow time in the daily session for conference on oral exercises to the amount of five minutes per week for each pupil; (3) that each school be encouraged to work out its own course in composition to suit local conditions, stressing in the first year the group method of collaboration and the preparation of themes on how to do something or make something.

This experiment has been described at some length because, dealing with high-school English though it does, it represents the sort of procedure by which the value of certain types of material for instruction may be determined. Moreover, the kind of treatment which was found to be best for the ninth grade would beyond reasonable doubt prove equally satisfactory for the seventh and eighth.

## II. TESTS AND RECOMMENDATIONS IN GRAMMAR

The most pressing problem in the grammar grades, however, is to decide what sort and how much of grammar to teach. Opinion on this

subject, as everybody knows, has been oscillating between radical and conservative views for many years. The conservatives hold (1) that the study of English grammar in the elementary school is of great value as an aid to clear and correct composition and intelligent reading; (2) that it is a training in thinking or at least that it "disciplines the mind"; (3) that it is necessary for those who will continue the study of English in high school and take up there the study of foreign language; and (4) that the facts and principles of English grammar belong to the body of knowledge which should be common to all in a civilized community.

The radical opposes some or all of these contentions. He declares (1) that the study of grammar is of little or no value either to composition or to reading, for both are made possible only by habit based upon imitation and not by learning the rules which govern the relating of words in sentences; (2) that the alleged training in thinking does not "carry over" and that mental discipline in general is a myth; (3) that such grammar as is actually needed in high school should be taught there; and (4) that only the pedant sees value in general familiarity with grammatical terms and facts.

There are of course many shades of both radicalism and conservatism and some mixed views, but the summary just made will serve to define the question.

1. *Hoyt's report on grammar.*—The first attempt to determine by scientific methods the place of grammar in the elementary curriculum was made by Franklin S. Hoyt in 1906. The plan followed was, "first, to trace historically the teaching of English grammar . . . ; secondly, to ascertain upon what grounds the teaching of grammar is justified by current pedagogical literature and by teachers; thirdly, to test the validity of each of these arguments; and, finally, if possible, to draw some conclusions that will aid in the formulation of courses of study in English."<sup>1</sup>

Historically, Mr. Hoyt observes, the study of English grammar came in near the close of the Elizabethan period. "The language had attained its greatest vigor and beauty before the 'science of speaking and writing correctly' had been formulated." The first grammar was for the use of foreigners and was modeled upon the Latin grammars in vogue.

<sup>1</sup> Franklin S. Hoyt, "Studies in the Teaching of English Grammar," *Teachers College Record*, VII, No. 5, November, 1906.



Thus it was loaded down with rules and distinctions not applicable to English, which have been reluctantly dropped because of the scholastic theory that the study of them is good mental discipline.

Persons expressing opinions as to the place of grammar in school Mr. Hoyt classifies as follows: (1) those who believe in teaching no formal grammar in the elementary school; (2) those who would have grammar taught as a distinct regular subject; (3) those who would have it taught only incidentally in connection with the language-work. The second group, those favoring formal grammar, advance the arguments summarized above, particularly that of mental discipline. This argument Mr. Hoyt thinks unimportant so far as elementary children are concerned, since the more abstract conceptions of grammar are for the most part beyond them, and in any event the researches of Thorndike and others have thrown grave doubt upon the whole contention that discipline is to any great extent carried over.

As for the need of laying a foundation for studying other languages, Mr. Hoyt quotes with approval the views expressed by earlier writers, who hold that other languages are well fitted for grammatical study and may well take care of themselves. The few terms in general use can be learned without the necessity of an extended course in English grammar.

The remaining arguments, namely, that both expression and interpretation are aided by grammar study, Mr. Hoyt subjected to investigation. He gave tests in composition, in grammar, and in interpretation to pupils in three cities who had entered high school about four months before. Space will permit only a summary of his results. He found practically no correlation between the ability to answer questions of grammar and the ability to write or to read (a condition which was afterward found to characterize the work of hundreds of high-school graduates who wrote examinations in English for entrance to the Chicago Normal College; indeed, it often appeared in the case of these students that time spent upon formal grammar had been at the expense of training in composition).

The conclusions drawn by Mr. Hoyt from this study were as follows:

(1) A critical examination of the arguments usually advanced in favor of the study of grammar leads to their rejection, in the main, when applied to the present teaching of formal grammar as a separate subject in elementary schools.

(2) It is therefore recommended that grammar should not be taught as a separate subject in the elementary grades, at least below the eighth year.



And that only such grammatical facts and principles be taught in these grades as have a direct bearing upon the use of language for expressing and interpreting thought. Such grammatical instruction should be incidental to the practical study of language, and should evolve from it. During the last year of the elementary course pupils should systematically review and organize the knowledge of grammar thus incidentally obtained, so that it may be permanently retained in convenient form for use and as a foundation for any future linguistic study.

To these was appended, by way of suggestion, an outline of such grammatical forms and classifications as might be taught in the elementary school. This included:

- (1) Classification of sentences:
  - a) As to form: simple, compound, complex.
  - b) As to use: declarative, interrogative, imperative, exclamatory.
- (2) Phrases and clauses.
- (3) The parts of speech, with only such classifications of them as are actually of use; e.g., proper noun for the use of capitals.
- (4) Inflections:
  - a) Singular and plural forms of nouns, pronouns, and verbs.
  - b) Declension of pronouns. (Case and person developed in connection with personal pronouns.)
  - c) Possessive forms of nouns.
  - d) Comparison of adjectives and adverbs.
  - e) Principal forms of verbs, with little regard to conjugation, mode, voice, tense, etc.
- (5) The more useful rules of syntax; e.g., "A pronoun used to complete the sense of an intransitive verb is in the nominative case."

The basis of the selection of this material is obviously its relation to the probable needs of the pupils. It includes all of grammar that is referred to when it is stated that "Grammar is useful as a tool of thought." It excludes all that has been retained solely because of its supposed disciplinary value, or for the purpose of information. The small amount of material remaining, constituting as it does an essential part of the training of English, will be taught in connection with the language-work and, under fairly skilful teaching, so persistently applied as to become an effective tool in the work in composition and interpretation. It will thus no longer remain an illogically distinct subject to be hastily swallowed as a dimly apprehended and distasteful abstraction, but it will be assimilated as a vital part of the child's language experience, thus insuring both a better understanding of the really fundamental grammatical principles and greater skill and enjoyment in the use of the language

as a means of expression. This will be brought about through the better mastery of these grammatical principles and because of the substitution of the more fruitful English work for the discarded instruction in grammar.

2. *Briggs's report on grammar*.—Whether grammar provides an important means of mental discipline, Mr. Hoyt did not investigate. This task was undertaken some years later by Thomas H. Briggs at Columbia University.<sup>1</sup> He made a survey of the claims which have been advanced for formal grammar as a discipline but found no experimental evidence to support them. He accordingly arranged several sets of tests, some of which had previously been used by Bonser, Whipple, and others, to determine the mental ability of children. Two classes in the seventh (the highest) grade of the Horace Mann Elementary School were given intensive work in formal grammar for three months and tested from time to time as to their ability to see likenesses and differences, form definitions, judge reasons, use data, reason in arithmetic, make prompt and accurate associations, follow directions, etc. The results obtained were compared with those which appeared in schools in five other cities and in the practice departments of two normal schools.

There was no gain in any ability which could be attributed to the work in grammar and surprisingly little, in view of the effort put forth, in the knowledge of grammar itself. Mr. Briggs concludes that, while future experiments may lead to different conclusions, the burden of proof, at any rate, is now upon those who believe that general mental discipline is obtained from the study of formal grammar.

3. *Charters' report*.—More recently a study has been made by Professor W. W. Charters, of the University of Missouri, which seems likely to be of considerable value in making out courses for schools.<sup>2</sup> This was an investigation to determine what errors connected with grammatical rules were made by the children of Kansas City, and to determine upon this basis what rules should be taught to children in the elementary grades. Definite directions were sent to the teachers of Grades III–VII<sup>3</sup> as to the sort of written work to collect and also as to noting and recording errors in speech. Only papers which the pupils

<sup>1</sup> Thomas H. Briggs, "Normal English Grammar as a Discipline," *Teachers College Record*, XIV, No. 4, September, 1913.

<sup>2</sup> Not yet published but will appear as a bulletin of the University of Missouri.

<sup>3</sup> The seventh is the highest grade in the elementary schools of Kansas City.

wrote freely without help or corrections were to be handed in. The pupils were to be left unconscious of the test and were not to use any special kind of paper or make any special effort. The purpose was to get during a period of four weeks as much writing as possible, with no repression or caution from the teacher. Errors in speaking were carefully noted and written down by all teachers and principals during the entire school time of a single week.

The oral errors were then classified by graduate students under Mr. Charters' direction, with the advice and assistance of certain of the university instructors in English. The written papers from the sixth and seventh grades in twelve schools were afterward examined and the errors collected. When the various errors were thus assembled and percentage tables made out, it was possible to arrange an outline of the rules actually broken and an additional outline of the rules necessary in order to understand those which had been broken. For example, the rule that a verb must agree with its subject in person and number is unintelligible to one who does not know the meaning of subject, person, number, verb, etc. This procedure made clear what must be included in the course to meet certain definite needs.

The language texts in use in the Kansas City schools were next examined and a statement prepared to show what might be omitted from them. The topics included in this "*Index Expurgatorius Grammaticae*" are exclamatory sentence, interjection, the appositive, the nominative of exclamation, the nominative of address, the objective complement, the objective used as a substantive, the adverbial objective, the indefinite pronoun, the classification of adverbs, the noun clause, conjunctive adverbs, the retained objective, the infinitive except the split infinitive, mood (except possibly the subjunctive of "to be"), the objective subject, the participle (except the definition and present and past forms), the nominative absolute, and the gerund. Two topics needed to be supplied, the pronoun "what" and proper and numeral adjectives.

Positively the study seems to show that there are a number of grammatical principles which should be well taught. Among these are: (1) proper as contrasted with common nouns; (2) the possessive of nouns; (3) the formation of the plural; (4) the inflections of pronouns; (5) the uses of the relative pronouns; (6) the cardinal and ordinal numerals; (7) comparison of adjectives; (8) verbs as to kind, number,

tense, and voice; (9) adverbs as distinguished from adjectives; (10) idiomatic uses of prepositions and conjunctions; (11) placing of modifiers; (12) double negatives; (13) syntactical redundance, and of course (14) the sentence as a unit. The number of failures to begin a sentence with a capital and end with a period or other proper mark was very large.

4. *Other studies and reports.*—Other somewhat similar studies of children's language are now in progress. For example, the department of education in Harvard University is directing an investigation of the natural history of the sentence in the expressions of children, with the purpose of learning at what stages instruction in certain phases of grammar and composition will supply actual needs. We are clearly about to enter upon a period in which both courses and textbooks in language for the elementary school will be constructed in the light of relatively exact information in place of rough and ready opinion based upon personal impression and unthinking tradition.<sup>1</sup>

### III. STANDARDS OF ATTAINMENT

One method of preventing waste of time and effort in school work is to set up definite standards of attainment. Like many other good things, such standards may easily prove harmful. They may, for example, narrow the field of endeavor to the point of hampering the teacher and rendering her work machine-like. Absence of such standards, on the other hand, usually means low pressure, a good deal of useless wandering, and great unevenness of results. The educational rhapsodist is content with purple patches and unfulfilled dreams, but the practical administrator expects tangible and consistent progress. If reasonable latitude is allowed as to the means, there can be no serious objection to fairly definite prescription as to ends.

In English, as in other subjects, the textbook is still the real gauge. Many courses of study undertake to state in general, and even in particular, what is to be accomplished during the elementary period as a whole and during each year or semester of it, but only the strong teacher can carry out such a program without the aid of a book in which the material for each period is arranged and the work which the pupils are to do indicated. Books should, however, be made to conform to the course of study. At present the course of study is generally made

<sup>1</sup> Allan Abbott, "Scientific Standards in English Teaching," *English Journal*, IV, No. 1, January, 1915.



to conform to the books. We must develop a technique of criticism for textbooks. A school board is now almost as much at a loss to tell what books to buy as it is when called upon to select an administrative officer. What action it will take in either case is largely a question of salesmanship.

Interest in the movement for a reform of our educational system by beginning secondary work with the seventh grade has stimulated endeavor to formulate the attainments which should be expected at the end of the sixth grade. In the report of the Committee on the "Six-Year Course of Study," which was presented to the Department of Secondary Education of the National Education Association at the Cleveland meeting in 1908, we find the following specifications with regard to English:

A. *Reading*.—Pupils should be able to get the thought and express the thought in simple narrative prose and poetry, such as *Robinson Crusoe* and "Paul Revere's Ride."

B. *Spelling*.—They should be able to spell correctly 90 per cent of the words commonly used in their home and school vocabulary.

C. *Writing*.—They should be able to write legibly and with fair rapidity.

D. *Composition*.—(1) They should be able to compose and write a business or social letter in conventional form on a simple assigned topic that properly comes within the experience of children of their age. (2) They should be able to compose and write short descriptions and narratives on simple themes appealing to the natural interests of children and falling within their experience.

A somewhat similar attempt to set up definite standards in English for the new elementary schools has been made by the Joint Committee of Thirty on a National English Syllabus, which constitutes one of the subcommittees of the Commission on the Reorganization of Secondary Education, and which is acting under the direction also of the National Council of Teachers of English. In its second preliminary report at St. Paul in July of 1914 a subcommittee of this committee offered the following:

#### ATTAINMENT IN ENGLISH AT THE END OF THE SIXTH SCHOOL YEAR

The Committee on English has assumed from the beginning that in the near future secondary education in the United States will begin with the seventh school year. Hence, in seeking to provide for proper articulation



between elementary and secondary work in English, the committee has found it desirable to inquire as to what sort of foundation in English can be laid in the first six grades. It cannot be too strongly emphasized, however, that the committee does not assume the right or the wisdom to set up standards of admission to the high school. The painful history of college-entrance requirements and the equally painful history of the overloading of the elementary course of study by the well-meaning college specialists on the Committee of Ten and its subsidiary committees provide a sufficient warning. Such statements of attainment as the present committee will venture to make will be drawn from the actual experience of elementary principals and teachers and will be found modest enough. Indeed, what is most needed is not a theoretical raising of standards but a sorting out of essentials and more generally efficient methods of securing a mastery of them.

It is important to bear in mind that there are two distinct aspects of the process of education. The first is purposeful activity, resulting in habit, and the second is interpretation of experience, resulting in knowledge. Both should have a place in the elementary school, but unquestionably the first should receive chief emphasis there. Children learn by *doing* rather than by the more formal rationalizing processes. Indeed, the chief distinction between the education of children under twelve and those above that age is to be found in the fact that with the seventh grade may be said to begin the really systematic ordering of the facts of experience into scientific knowledge.

It follows that a statement of attainment for the elementary period should be mainly in terms of habits, of ability to do, rather than in terms of facts and principles which the children should be expected to state. Granting that the unity of consciousness prevents any actual separation of doing and knowing, one may nevertheless hold that there is great advantage in measuring achievement in terms of the former. After all, the only sufficient test of ability is the meeting and mastering of real conditions, and teachers need constantly to be on their guard lest they mistake a certain facility in professing the forms of knowledge for actual initiative and control.

With these principles in mind we may now attempt to state in outline what normal children may be expected to do when they have reached the close of the sixth grade:

1. To express clearly and consecutively, either in speech or in writing, ideas which are entirely familiar to them.
2. To avoid, both in speech and in writing, gross incorrectness of grammar.
3. To compose and mail a letter, using a form acceptable for general purposes.
4. To spell the vocabulary which they commonly write and to make sure of new or doubtful words.

5. To read silently and after one reading to reproduce the substance of a simple story, news item, or lesson.

6. To read aloud readily and intelligibly news items from the school paper, lessons from the textbooks being used, or literature of such difficulty as "Paul Revere's Ride" or Dickens' *Christmas Carol*.

7. To quote accurately and understandingly several short poems, such as Bennet's "The Flag Goes By" and Emerson's "The Mountain and the Squirrel."

8. To make intelligent use of ordinary reference books.

Everyone will understand that such an outline is in no sense to be regarded as a course of study in English nor as a complete summary of all that children should and do gain from the study of reading and composition. The more fundamental and far-reaching results, which can be expressed only in terms of character, are here only implied. They come, moreover, if they come at all, from the entire life of the school, not from a single study. Nevertheless, teachers of experience will see at a glance that it will require a well-organized and efficiently administered course to establish, not merely in the exceptional child, but in all normal children, the habits set forth in the seven items mentioned above. For the true best of such habits is that they assert themselves regularly, not merely under the special conditions of a school examination.

Both these statements have been quoted with regard to attainment in all phases of English work in order to show the composition element in its relations. Distinct advance has been made by the second report in the clear emphasis placed upon speech, including correctness of grammar, and in omitting reference to certain types of discourse, particularly literary types. This report also recognizes the problem of articulation between the elementary and the secondary schools.

That subject has been studied with great care by another committee of the National Council of Teachers of English, whose findings concerning composition and grammar are highly suggestive as to the topic under discussion, namely, definite standards of attainment based upon essentials as a means to economy of time.<sup>1</sup> Their recommendations are based upon answers to a questionnaire, upon an examination of a large number of courses of study, reports, and textbooks, and upon personal observation, experience, and conference. The committee had in mind the usual eight-year elementary course, and hence its report covers the grammar grades.

<sup>1</sup> Ernest C. Noyes, "The Articulation of the Elementary and High-School Courses of Study," *English Journal*, III, No. 5, May, 1914.

The committee finds much more called for on paper than by any possibility can be accomplished—maximum courses without principles of selection. High-school topics are being attempted in the grades, especially in the case of formal grammar and rhetoric, while simpler and more essential matters are not thoroughly taught. Written composition is emphasized at the expense of oral. The work to be done is not clearly indicated and confusion must be inevitable.

The committee makes definite constructive suggestions as to what the work in composition and grammar should include and these deserve a careful reading.<sup>1</sup> They have been borne in mind by the present writer in preparing the summary with which this paper ends. To this and the other sources named above may be added numerous state and city courses of study and such articles and opinions as those of Mrs. Fish and Miss Fontaine, reference to which will be found in the bibliography appended.

#### SUMMARY AND CONCLUSION

At the end of about a decade of study, investigation, and discussion of the problem of economy in language and grammar it appears that progress has been made:

1. In singling out those activities which are most valuable and in setting up definite standards of attainment.

2. In eliminating much abstract and formal material, especially in English grammar. If the grammatical aspects of composition have been consistently dealt with in the grades below, forty recitations in the grammar grades should suffice to organize all the science of grammar likely to be useful to a child of fourteen. This implies that the regular terms for grammatical concepts are used whenever there is occasion to refer to grammatical forms and relations in connection with either speech or writing.

3. In developing standards of measurement by which the results of work in composition may be more accurately determined. Only a slight beginning can be recorded here, however; so complex a product as a written paper cannot be measured as to its various qualities by a single scale like that of Hillegas.

4. In laying a foundation of educational principles in accordance with which the details of economy may be worked out.

<sup>1</sup> *Ibid.*, pp. 311-12.

In seeking to define the essentials of language and grammar we must first discover what the aims of common-school education are. Preparation for life, for example, must be carefully analyzed into those specific aspects which such preparation includes.

The language course must be thought of mainly in terms of habit. Power to speak and to write, not to define technical terms or state rules of correctness, is the end to be attained. The content of oral and written expression as a subject of study in the elementary school is not mainly the principles of composition and grammar but rather the child's own expanding ideas about his environment and his own part in it. Only so much of theory should be taught as can be realized by the child himself, and this should be directly related to his experience.

We must seek to choose that subject-matter for each grade which can be made to seem real, can have a genuine appeal, to the pupils. The mere distribution through a series of years of facts, principles, and practice exercises to develop knowledge and skill which it is supposed will be needed later must be replaced by experiences and formulations which are of real use here and now.

Definite standards of attainment must be set up instead of vague notions of freedom and originality in language or its wooden and mechanical prototype, mere correctness.

This will involve more accurate measures of excellence than we have been accustomed to use. Personal idiosyncrasy and subjective impression must be corrected and supplemented by objective standards by means of which educational experience in one set of circumstances may be compared with like experience in other circumstances, and by which the value of certain kinds of subject-matter and types of reaction may be more accurately determined.

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## CHAPTER VIII

### CURRENT PRACTICES AND STANDARDS IN ARITHMETIC

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Certain phases of arithmetic have been subjected to challenge for many years. Educational theorists, educational investigators and men in actual charge of educational affairs have been critical toward the content, method of teaching, time expenditure, gradation and achievement in the subject.

The theorists have been especially forcible in their condemnation of the teaching of many of the more or less obsolete topics, the artificialities of method and the amount of time given over to the subject. Hall condemned the amount of time devoted to arithmetic, saying, "Nowhere in the whole curriculum can so much time be saved."

Within recent years there have been a number of special investigations in regard to the arithmetic situation. In 1902 J. M. Rice tested the arithmetical knowledge of more than 6,000 children. In 1908 C. W. Stone tested 6A grades in 26 cities. These men found wide variations in achievement, time cost, methods of teaching and supervision.

In 1913 Superintendent L. H. Van Houten made an investigation of the time distribution, the grade distribution of topics and certain other supervisory phases of arithmetic in 150 American cities. Last year the writer and Dr. L. D. Coffman, working for the Committee on Economy of Time, made an investigation of the time expenditure, grades in which textbooks are introduced, emphasis on drill, eliminations and new topics in almost a thousand school systems.

The men in the field—superintendents and teachers—have also given serious consideration to the demands of arithmetic. In 1887 President Francis A. Walker conducted a campaign in the Boston schools which resulted in an order by the School Committee that the following subjects be dropped from the course of study: mensuration of the unusual surfaces and solids, compound proportion, compound interest, equation of payments, exchange, metric system, compound partnership, etc. In the



report of the Baltimore School Commission in 1911 considerable attention was given to arithmetic as to time expenditure and topical emphasis. Superintendent G. M. Wilson, of Connersville, Indiana, in the same year found, after a detailed investigation of a number of courses of study in use elsewhere, that many cities had already made eliminations.

The American Committee No. 1 of the International Commission on the Teaching of Mathematics reported in 1911 on mathematics in the elementary schools. This committee and its subcommittees contained the names of more than forty men and women more or less intimately connected with the problem of mathematics instruction. As a result of their investigation of the subject, they said, "There is a great pressure to simplify the course. This is being done by using smaller numbers in the work in arithmetic; by eliminating topics that are unduly confusing; by giving carefully graded, simple problems; and by cutting down the extent and increasing the emphasis on the part that remains. There is also great pressure to modernize the course. This is being done by eliminating obsolete problem material, topics and processes, and by substituting therefor modern problem material. There is pressure to make the subject possess informational value as well as disciplinary value."

Mr. S. A. Courtis, director of research of the Detroit public schools, has made the most thoroughgoing study which has yet been made of achievements in addition, subtraction, multiplication and division which are being attained in arithmetic throughout the different grades in a large number of cities. Indeed the investigation of Mr. Courtis has been carried so far that he has already set up certain tentative standards of expectancy for the fundamentals in the upper grades.

With a view to finding out the extent to which superintendents were interested in these problems, their attitude toward certain proposals for elimination and current practice in the schools, the writer and Dr. Coffman last year made an investigation which included returns from 867 cities with a population of 4,000 and over and from 114 county superintendents throughout the country. This report was presented before the Department of Superintendence of the National Education Association at the Richmond meeting. It was found that there was great interest in the topic and that a large percentage of the superintendents were alert to the possibilities of effecting economy of time by means of omitting certain material, redirecting emphasis on certain other

material and modifying the time cost. In fact school superintendents in large numbers are already at work making modifications with a view toward testing the theories or profiting by the facts thus far discovered. Thus in a certain sense this present report might be considered as a clearing-house of experience, which will enable any superintendent to know what other superintendents are doing.

In the judgment of the Committee on Economy of Time the time is now favorable for the widespread dissemination of information in regard to policies already adopted in a large number of cities. Educational theorists have projected certain ideals in the light of the whole field of education. The special investigators have presented a body of facts showing the standards or norms in practice, covering a wide enough range of conditions to warrant certain consideration. The superintendents themselves are experimenting in many different directions. Although theorists, investigators and superintendents are not perfectly agreed, there is sufficient agreement to make it worth while to know its extent on the following points: (1) the elimination of topics; (2) increased emphasis on topics; (3) the recitation time distribution; (4) the percentage of drill; (5) grade of textbook introduction; (6) grade emphasis on topics; (7) the standards of achievement.

#### THE ELIMINATION OF TOPICS

In view of the fact that such a large percentage of the superintendents of the country have already either eliminated these topics or are in favor of giving them less attention, it is recommended that an economy of time may be effected by the elimination of the following topics from the elementary course of study: apothecaries' weight, alligation, aliquot parts, annual interest, cube root, cases in percentage, compound and complex fractions of more than two digits, compound proportion, dram, foreign money, folding paper, the long method of greatest common divisor, longitude and time, least common multiple, metric system, progression, quarter in avoirdupois table, reduction of more than two steps, troy weight, true discount, unreal fractions.

Chart I, which is based on the expression of the superintendents in 830 cities last year, shows the percentage of superintendents who favor the elimination of or less attention to these topics. (Taken from the investigation of Jessup and Coffman.)

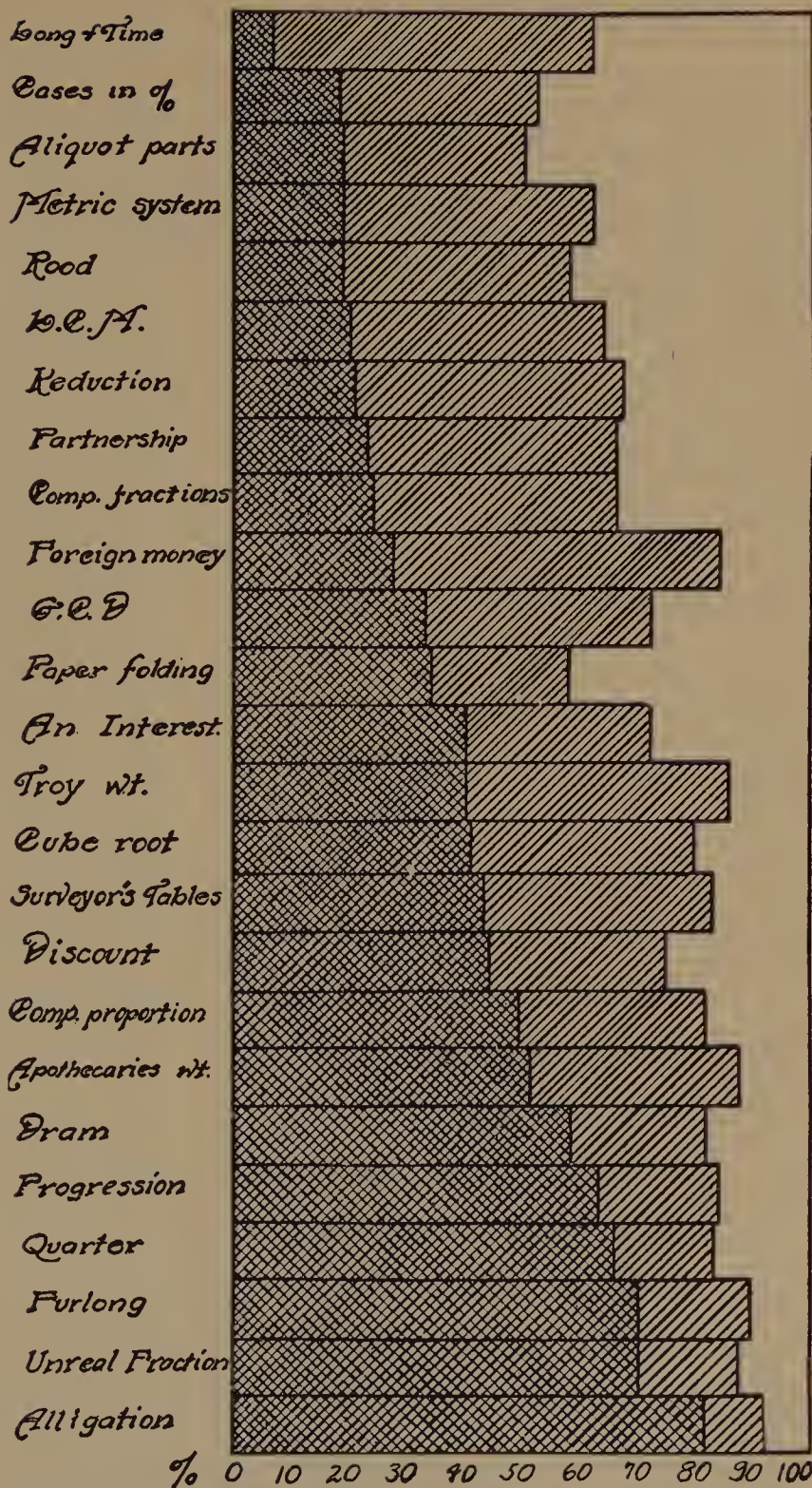


CHART I.—Percentage of superintendents who favor “elimination” or “less attention” (830 cities represented). Checked surface represents the percentage who favor elimination. Shaded surface represents the percentage who favor less attention.



## INCREASED EMPHASIS

There has, no doubt, been a disposition on the part of some educational theorists and some superintendents to minimize the importance to be given to training in the fundamentals in arithmetic, viz., addition, subtraction, multiplication, division of whole numbers and fractions. Certain pedagogical theories have tended to minimize the importance of this phase of the work. These theories, coupled with the fact that arithmetic has received a great amount of time, have resulted in a disposition in certain quarters to neglect the teaching of these fundamentals.

However, it is certainly an important fact that the majority of superintendents throughout the country are in favor of emphasizing these fundamentals. It is recommended that this phase of arithmetic be especially emphasized in the intermediate grades to the end that children attain a high standard of ability in these processes by the time they have completed the sixth grade.

It is further recommended that the applications of arithmetic to the social and economic conditions of the day be given especial attention. Time saved through the omission of the material mentioned in the foregoing may be wisely devoted to the study of the social, economic and arithmetical issues involved in such facts as saving and loaning money, taxation, public expenditure, banking, borrowing, building and loan associations, investments, bonds and stocks, tax levies, insurance, profits, public utilities and the like.

Chart II shows the percentage of superintendents who favor giving more attention to each of these topics. (Based on the investigation made by Jessup and Coffman.)

## RECITATION TIME

The investigation reported last year brought out the fact that a wide variation existed in the amount of recitation time given over to arithmetic in the various grades. The results of the investigations by Rice, Stone and Courtis have been such as to indicate that it is easily possible to expend more recitation time on arithmetic than conditions warrant. These men are all of the opinion that there is great danger of wasting time here. In view of these investigations and in view of the fact that half of the superintendents are already giving the proposed time or less per week for recitations in arithmetic in the different grades, it is

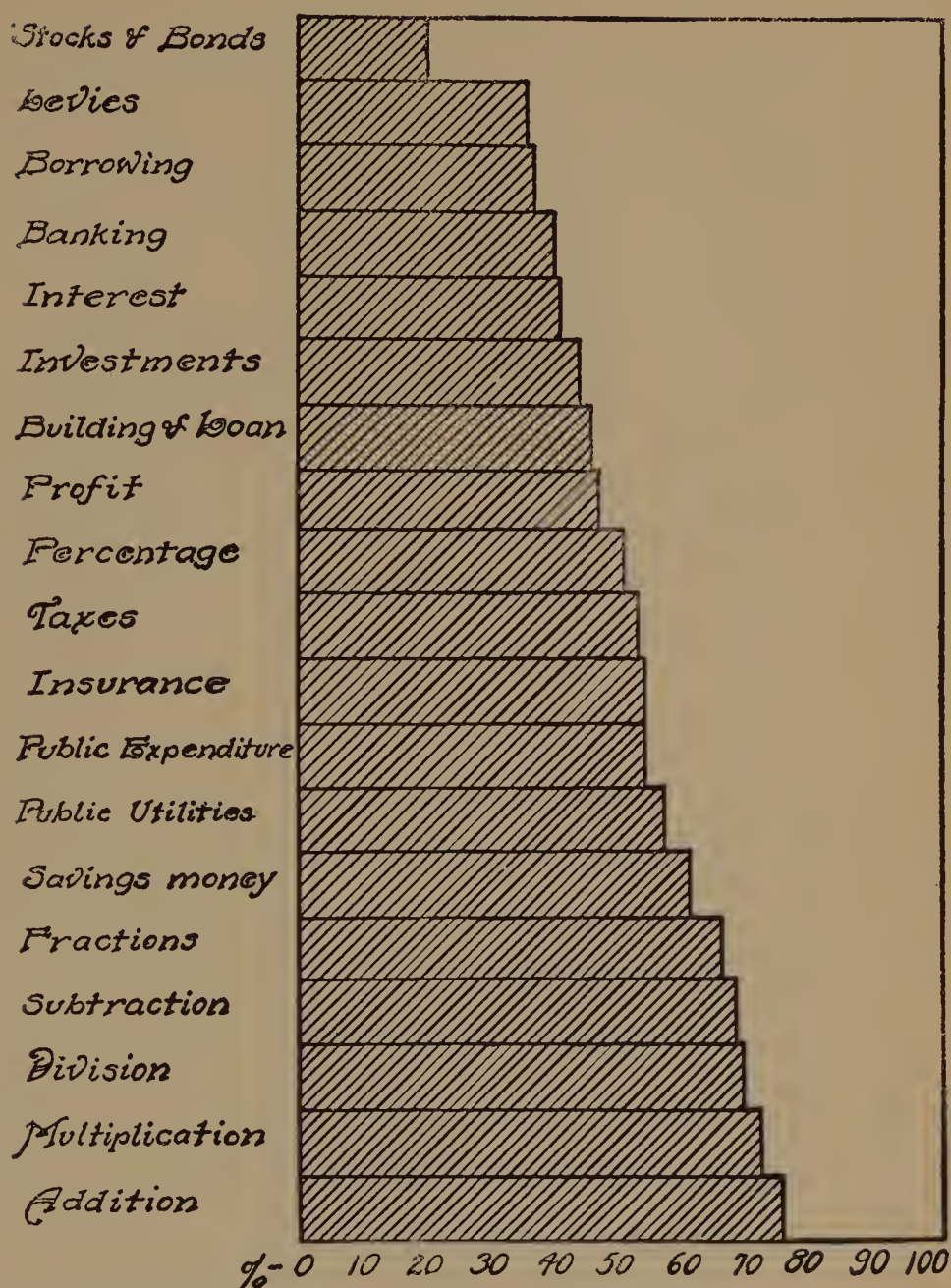


CHART II.—Percentage of superintendents who favor giving more attention to each of these topics (830 cities represented).



recommended that the recitation time devoted to arithmetic not exceed the following limits:

The first grade not to exceed 75 minutes per week.

The second grade not to exceed 100 minutes per week.

The third grade not to exceed 125 minutes per week.

The fourth, fifth, sixth and seventh grades not to exceed 150 minutes per week.

The eighth grade not to exceed 170 minutes per week.

These standards or norms are based on the median recitation time expenditure in 630 cities as reported before this section last year.

Table I shows the actual distribution of recitation time devoted to arithmetic in these cities. (Based on the investigations of Jessup and Coffman.) This table should be read as follows: In the first grade 136 cities allow no time for arithmetic, 7 allow 15 minutes per week, 18 allow 25 minutes per week and so on down the column. (Extreme cases were verified by supplementary correspondence, so that the variations here indicated are truly descriptive of variations in practice.)

Chart III shows the median and upper and lower quartiles for this table.

#### PERCENTAGE OF TIME GIVEN OVER TO DRILL

There is a clear tendency on the part of the superintendents throughout the country to emphasize the lower grades as the grades demanding the highest percentage of time given over to strictly drill work in the recitation. This is in line with the current educational theory of the nature of the mental life of the child. It is of interest to note in this connection that the school superintendents have either taken the advice of the theorists in this particular or as a result of their own experiences have agreed with the theorists. At any rate it is a fact that at the present time the majority of the superintendents are giving the highest percentage of recitation time to strictly drill work in the second, third and fourth grades. The median percentage of time given to drill work throughout the different grades is as follows:

First grade.....	43	per cent
Second grade.....	50	" "
Third grade.....	52	" "
Fourth grade.....	45	" "
Fifth grade.....	39	" "
Sixth grade.....	31	" "
Seventh grade.....	22	" "
Eighth grade.....	17	" "

TABLE I

No. MINUTES PER WEEK	GRADES								
	I	II	III	IV	V	VI	VII	VIII	IX
0.....	136	31	4	.....	.....	.....	.....	24	439
15.....	7	2	.....	.....	.....	.....	.....	.....	.....
20.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
25.....	18	1	1	1	1	.....	.....	.....	.....
30.....	10	7	5	1	.....	1	1	1	.....
35.....	1	.....	.....	.....	.....	.....	.....	.....	.....
40.....	6	4	2	5	2	1	.....	1	2
45.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
50.....	99	36	3	1	4	4	2	2	.....
55.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
60.....	27	22	10	5	3	4	5	5	4
65.....	1	.....	.....	.....	.....	.....	.....	.....	.....
70.....	3	3	1	1	1	1	2	1	1
75.....	103	127	59	12	4	.....	.....	2	.....
80.....	6	5	10	11	2	3	1	1	1
85.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
90.....	5	6	12	3	4	2	3	3	2
95.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
100.....	108	83	156	129	71	31	14	10	3
105.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
110.....	1	1	6	5	3	.....	.....	2	1
115.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
120.....	6	10	13	13	12	19	22	18	4
125.....	17	40	90	113	132	109	59	36	5
130.....	.....	3	4	5	6	9	3	.....	2
135.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
140.....	.....	.....	2	4	6	1	9	8	2
145.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
150.....	53	66	98	129	158	196	210	192	30
155.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
160.....	1	2	4	4	6	2	7	8	5
165.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
170.....	.....	.....	2	3	3	1	.....	2	.....
175.....	6	8	9	20	31	28	35	37	6
180.....	2	5	6	3	5	9	16	15	4
185.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
190.....	.....	1	.....	.....	.....	1	.....	.....	.....
195.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
200.....	11	33	54	56	52	72	96	121	60

TABLE I—Continued

No. MINUTES PER WEEK	GRADES								
	I	II	III	IV	V	VI	VII	VIII	IX
205.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
10.....	.....	3	2	.....	I	.....	2	5	7
15.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
20.....	.....	I	I	2	I	I	I	2	2
225.....	4	10	25	19	22	28	31	38	27
230.....	.....	.....	.....	I	I	2	2	2	.....
35.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
40.....	.....	4	8	8	4	4	4	7	I
45.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
250.....	I	9	25	39	51	51	45	34	13
255.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
60.....	.....	I	.....	I	I	2	2	2	.....
65.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
70.....	.....	.....	I	I	4	3	2	I	I
275.....	.....	2	2	8	7	9	8	5	I
To 300.....	.....	4	14	24	30	30	38	33	5
To 350.....	.....	.....	.....	3	2	3	7	8	2
To 450.....	I	I	I	.....	.....	.....	2	3	.....

Chart IV shows the median and upper and lower quartile percentages of time given over to strictly drill work in the recitations in each grade in 564 cities. The standards or norms in the foregoing table are based on the median practice in these cities. (Based on the investigation of Jessup and Coffman.)

#### GRADE OF TEXTBOOK INTRODUCTION

In recent years there have been a good many advocates of the plan of postponing the introduction of a textbook in arithmetic until the third grade. Advocates of the policy have been found among experienced superintendents as well as among educational theorists. In connection with these recommendations it is of importance to note that of the 764 superintendents reporting last year on this topic it was found that the majority introduced the textbook in the third grade. Clearly the superintendents of this country have adopted the policy of placing a textbook in the child's hands at a relatively late time, as is indicated by the fact that a third of the schools are already postponing the time of introduc-

tion of textbooks until the fourth grade or later. The superintendent who is in doubt as to the grade in which a textbook should be introduced may find some satisfaction in knowing the practice of other superintendents. The exact distribution of the varying practices in connection with the grade of introduction of the textbook is indicated in Table II.

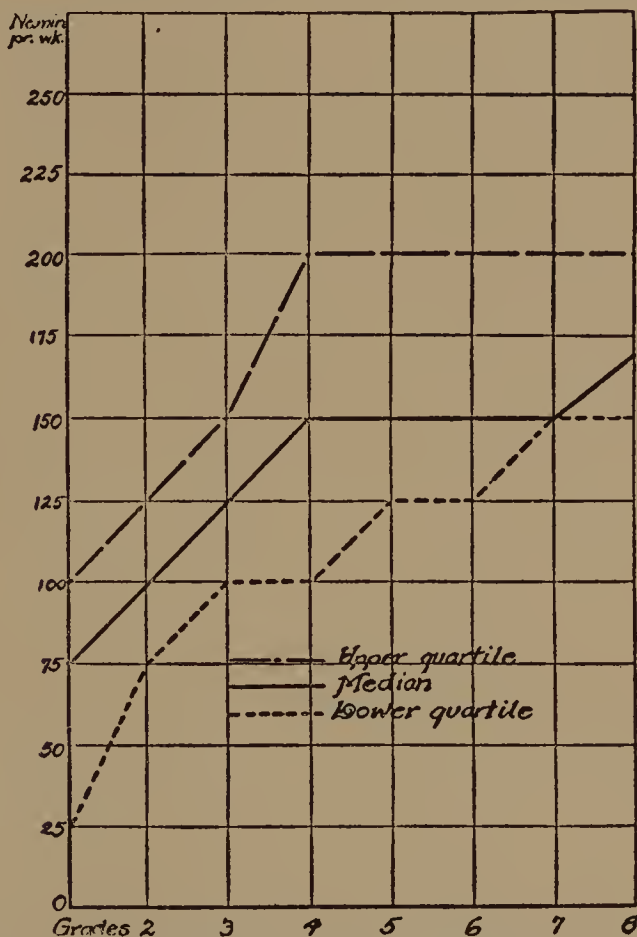


CHART III.—Showing median and quartile distribution of time per week given over to recitations (630 cities represented).

(Based on the investigation of Jessup and Coffman.) The meaning of Table II becomes clear when read as follows: Of the 267 cities reporting from the North Central territory, 1 introduced a text in the first grade, 18 in the second grade, 160 in the third grade, 64 in the fourth grade, 22 in the fifth grade and 2 in the sixth grade.

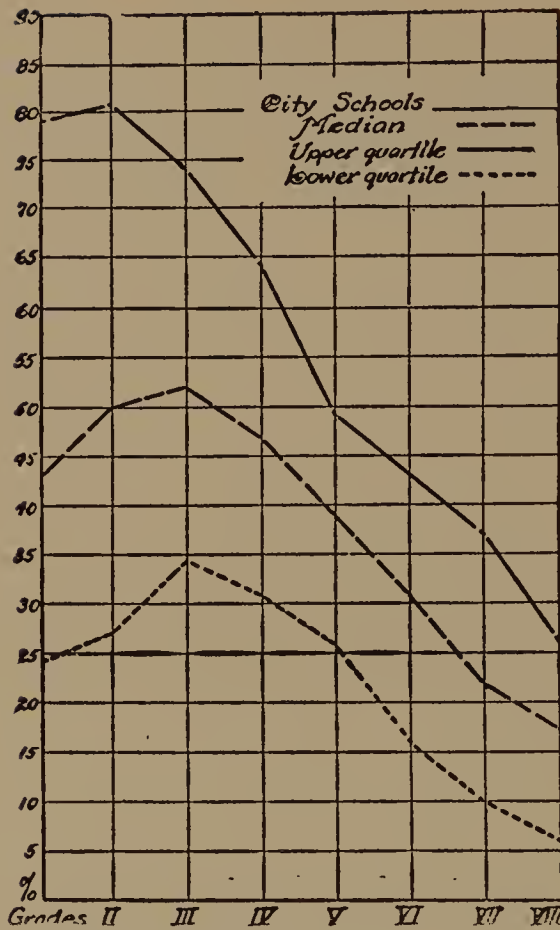


CHART IV.—Showing the median percentage of time given over to *strictly drill* work in the recitations in each grade (564 cities).

TABLE II

SHOWING GRADE IN WHICH AN ARITHMETIC TEXT IS INTRODUCED  
(By Geographical Divisions)

	I	II	III	IV	V	VI	Total
North Central.....	1	18	160	64	22	2	267
North Atlantic.....	2	9	122	78	15	0	227
Western.....	0	6	25	17	2	0	50
South Central.....	0	13	44	17	1	0	75
South Atlantic.....	0	4	19	5	2	0	30
Counties.....	2	16	53	28	4	3	106
	5	66	423	209	46	5	754



## GRADE OCCURRENCE OF TOPICS

The investigations of Dr. Payne, the Baltimore Commission, the International Commission and others touched the grade distribution of topics. The most thoroughgoing investigation of this sort, however, was made by Mr. L. H. Van Houten, a graduate student in the University of Iowa, now superintendent of schools of Toledo, Iowa, who investigated the distribution of thirty-seven selected topics in arithmetic in 147 different courses of study. These courses represented towns and cities of every size, distributed throughout the United States. He found wide variation in this particular. For example, notation was taught in every grade from the first to the eighth, although it was predominantly present in the third grade. Division was taught in every grade from the third to the eighth, but was predominantly present in the third and the fourth grades. Fractions were taught in every grade from the first to the eighth, and were predominantly present in the fourth and fifth grades. Multiplication tables were taught in every grade from the first to the eighth, but were predominantly present in the sixth grade. Simple interest was taught in every grade from the fourth to the eighth, although it was predominantly present in the seventh grade.

There seems to be less agreement in this particular than we might expect. No doubt many of the differences in practice are due to the textbook variations. Other differences are due to various conceptions of the nature of the mental life of the child and of the nature of the subject-matter. However, it may be said that in the main the four fundamental processes are most frequently taught in the first four grades; fractions, decimals and percentage most frequently in the grades from the fifth to the seventh, with the various applications of arithmetic to the social and economic phases of life becoming predominant in the seventh and eighth grades.

Mr. Van Houten, following the suggestion of the Baltimore Commission, distributed seven specific topics for grade frequency. From Table III it is seen that as far as these 147 cities are concerned the practice prevails of completing the forty-five combinations by the close of the second year; the multiplication tables by the third year; long division by the fourth year; fractions by the fifth year; percentage by the sixth year. Table III is to be read thus: 5 cities complete the forty-five combinations in the first year; 122 in the second year; 14 in the third year; 8 in the fourth year, etc.

While experimental evidence is lacking which will warrant a final statement in regard to the best time for the teaching of the various topics,

TABLE III

FREQUENCY TABLE SHOWING GRADE OCCURRENCE OF SEVEN SPECIFIED TOPICS  
(VAN HOUTEN)

TOPIC	GRADE							
	I	II	III	IV	V	VI	VII	VIII
Forty-five combinations completed	5	122	14	8	.....	.....	.....	.....
Multiplication tables completed...	.....	3	87	53	.....	.....	.....	.....
Long division taught.....	.....	.....	26	107	5	.....	.....	.....
Addition and subtraction of fractions taught.....	.....	.....	.....	29	108	13	.....	.....
Multiplication and division of fractions.....	.....	.....	.....	.....	120	18	8	.....
Decimals taught.....	.....	.....	.....	.....	91	66	3	.....
Percentage taught.....	.....	.....	.....	.....	9	93	46	2

yet it is of importance to know the practice of such a large number of cities. It may be presumed that this represents the best judgment of the superintendent, based on experience.

#### OBJECTIVE STANDARDS

The most definite work in connection with the problem of determining objective standards of achievement for children of the various grades in the fundamentals of arithmetic has been done by Mr. S. A. Courtis, director of research of the Detroit public schools. Mr. Courtis has been able to secure the co-operation of hundreds of teachers, superintendents and school officials to the end that his standard tests have been given to many thousands of children.

As a result of these examinations Mr. Courtis proposes the following standards for children in different grades in connection with the use of his test, on fundamentals of arithmetic, Series B.

In presenting these standards Mr. Courtis says:

"The following table gives the number of examples that should be worked correctly in the time allowed in the four operations with whole numbers. The scores represent standard speed. Teachers should aim at 100 per cent accuracy. At present the average accuracy is about 65 per cent.

"Translated into words, the table means that in June the graduate of a grammar school should be able to work correctly in eight minutes twelve examples like that under Test 1; in four minutes twelve examples like that under Test 2, etc.

TABLE I

JUNE STANDARD INDIVIDUAL SCORE IN THE FOUR OPERATIONS WITH WHOLE NUMBERS

Grade	Test 1 Addition	Test 2 Subtraction	Test 3 Multiplication	Test 4 Division
3.....	3	4	3	2
4.....	5	6	5	4
5.....	7	8	7	6
6.....	9	10	9	8
7.....	11	11	10	10
8.....	12	12	11	11
Time allowance (minutes) .....	8	4	6	8
Typical examples...	345 487 631 205 943 683 859 175 794	3479127468 1867396737	4179 36	67 ) 61707

"For any class, the percentage of the class membership which in June can reach or exceed these standards in any operation is a measure of the efficiency of the teaching of that operation in that class. Illustration: If in June eight children out of forty have a score of twelve examples or better in Test 1, with an accuracy of 100 per cent, the efficiency of teaching of addition in that class would be 8140 or 20 per cent. Teachers are urged to measure the efficiency of their own teaching."

## SUMMARY

Summarizing, first it is recommended that an economy of time may be effected by the elimination of obsolete material and by the increase of emphasis upon the fundamentals in the intermediate grades to the end that the children may have sufficient facility in the use of these phases to make it possible for the work in the upper grades to be centered around a concrete study of the quantitative phases of present-day social and economic life. Second, it is the dominant practice to center the drill work in the second, third and fourth grades. Third, the adoption of the median time in use throughout the country is recommended as an upper limit of time distribution. Fourth, it is the dominant practice to introduce textbooks in the third or fourth year. Fifth,

it is the dominant practice to complete the forty-five combinations by the end of the second year, the multiplication tables by the third or fourth year, long division by the fourth year, addition, subtraction, multiplication and division of fractions by the fifth, decimals by the sixth and percentage by the sixth or seventh year. Sixth, the standard achievement proposed by Mr. Curtis is commended as being worthy of the serious consideration of the superintendents of this country.

PART IV  
MINIMUM STANDARDS AND CURRENT PRACTICES IN  
THE CONTENT SUBJECTS

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CHAPTER IX  
THE DETERMINATION OF MINIMUM ESSENTIALS IN ELEMENTARY  
GEOGRAPHY AND HISTORY

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The following pages report an attempt to evaluate different methods that have been proposed for determining the particular subject-matter that should be included as "minimum essentials" in two of the "content" subjects of the elementary program. The principal problem was not what particular items of knowledge constitute these minimum essentials, but rather what criteria and what methods may be employed with validity in determining these particular items.

A. THE NEWSPAPER-MAGAZINE METHOD OF DETERMINING MINIMA

At a meeting of the Committee on Economy of Time held in the fall of 1912 it was suggested that current literature could be profitably employed as a standard for determining the kind of geographical information that the school should provide. The proposal was to read current newspapers and magazines, record the geographical references, and determine from the frequency of these references the relative value of the various types of geographical information. Results of the application of the method presented at the meeting seemed to indicate that the content of geography as now taught in the elementary school would be greatly modified if materials were chosen upon this basis. The basis of selection itself represents at least one important use that may be made of geographical information.

The writer set this problem as one of the topics in his graduate seminary in educational values during the spring of 1913. A large number of newspapers and magazines were read by members of the



seminary, the geographical and historical references were recorded and classified, and an attempt was made to evaluate the general procedure as a means of determining minimum essentials in these two subjects. While this preliminary work was not sufficiently extensive to justify anything in the nature of conclusive statements, the writer ventures the following opinions as a result of the trial:

1. A thoroughgoing application of the method might well result in a table showing the relative frequency with which certain geographical and historical references recur in the discussions of current problems, and this table might prove suggestive to teachers and administrators, and especially to textbook-writers, as indicating the relative emphasis to be placed upon different topics.

2. So far as the results of our initial test justify inferences they suggest that the present content of history and geography in the elementary school is not radically inconsistent with the need for geographical and historical information as revealed by a study of current publications; that is, the historical and geographical references that seem to recur most frequently in current literature commonly involve types of information already well represented in the school program.

3. If one were to take the newspapers and magazines of a single month as a basis for applying the method, one would be likely to get results that would make the materials taught in the school appear to be somewhat ill adapted to real needs; but when "samplings" of these publications are taken representing periods of from seven to ten years the recurring references stand out distinctly. The actual facts to be taught in the schools should, in the writer's judgment, emphasize the kind of information represented by these recurring references. To provide a basis for interpreting the numerous non-recurring references the pupil should be supplied with geographical principles of general applicability, and with general methods of procedure in finding and interpreting specific information. The recent developments in the teaching of geography have certainly emphasized this type of compromise—a compromise that is inevitable in framing curricula for the elementary and secondary schools. It is quite impossible to predict the precise type of particular knowledge that one will need in order to understand the current literature of ten years hence. To limit our instruction to the specific information that happens to be necessary at the present time would be a most shortsighted policy, but the particular facts

that have been of outstanding value for the past decade may reasonably be predicted to retain their value for some time to come. Beyond a careful impressing of these—using them, indeed, as a basis—it is possible to develop general principles and methods of work that will serve to adapt intelligence to the varying and non-recurring situations.

4. It would be reasonable to infer that, in the material which they furnish to their readers, newspapers are somewhat limited by the basis of interpretive knowledge that they may assume on the part of their readers. This inference is strongly borne out by the results of our initial tests. In certain newspapers we found geographical and historical references very few and far between. In such papers the appeal is largely upon the basis of primitive interests (or instincts) which can be safely assumed to be common to all; hence the so-called “sensational” character of such journals. On the other hand, there are journals that presuppose a large capital of interpretive information among their readers, and which are, for this reason, commonly limited in the number of their readers. This is strikingly illustrated by one periodical which was taken over by a publisher some years ago with the avowed intention of increasing its circulation. He succeeded admirably. We computed the number of historical, geographical, and literary references from an equal number of samplings over a period five years before and five years after the magazine changed hands. As the circulation increased the number of references decreased, and for some classes of references the decrease was almost precisely in proportion to the increase in circulation.

5. It would appear from these suggestions that any method that attempts to utilize current literature as a criterion for the selection of educational materials should be applied with a distinct understanding that it may simply result in a circular form of reasoning: current literature of a “general” nature is likely to represent pretty accurately the level of “general” education. In some respects, it is just as valid to infer from the content of the school program what the character of current literature *will* be as to infer from the character of current literature what the content of the school program *should* be. Certainly, if there is a causal relationship, it is from the school to current literature, and not vice versa.

*Typical results of the initial tests.*—From the reports of the members of the seminary who aided the writer in testing this method, the following

tables of frequencies have been selected as illustrating the possibilities and limitations of the method; the reports from which these tables are taken were made by the following persons: Miss Alice Biester, Miss Margaret Cobb, and Mr. H. T. McKinney.

Miss Biester collected and classified the geographical and historical references and allusions in eighteen issues of the *Outlook* and the *Literary Digest*, representing a period of seven years ending with 1913.<sup>1</sup> She found in these eighteen journals a total of 2,237 geographical references. The distribution was as follows:

References to facts of location, size, direction, etc., which may be assumed to require for their understanding a knowledge of "place and location" geography . . . . .	Per Cent 53.5
References to political divisions and facts of government which may be assumed to require a knowledge of "political" geography . . . . .	25.1
References to industries, commerce, products, etc., which may be assumed to require a knowledge of "commercial" geography . . . . .	5.8
References to people, customs, religion, education, etc., which may be assumed to require a knowledge of "social" geography . . . . .	4.8
References to places as scenes of historical events, which may be assumed to require a knowledge of "historical" geography . . . . .	1.7
Other references primarily of local or transitory interest . . . . .	8.9

A grouping of this sort is obviously subject to the errors or peculiarities of individual judgment, but it may be said that the classification just presented is quite consistent with those furnished by other readers. Except for the absence of explicit reference to physiographical principles, this grouping represents fairly accurately the distribution of emphasis in the textbooks ordinarily used in the seventh and eighth grades. The

<sup>1</sup> The method of counting references is an important detail in the technique of this work. Two methods were tried: (1) counting one for each term (such as the name of a place or of a historical event) or each statement with a geographical or historical content; and (2) taking as the unit the article in which the reference occurs, and counting one for each article containing a certain type of reference. (Thus, if London as a commercial center is referred to in an article, this group of references receives one credit, no matter how many times the word London may recur in the course of the article. But if in the same article London is referred to in another way a separate count under its appropriate group is made for this reference.) A comparison of these two methods showed clearly that the latter is to be preferred, and this was used in two out of the three investigations reported.

physiographical principles, however, are precisely the "general" principles to which we referred above; that is, their function is broadly interpretive and adaptive; they "cover" a host of particulars too numerous in the aggregate, and too insignificant separately, to warrant specific attention.

Another suggestive grouping is based upon the frequency of references to the various continents. If one is to read intelligently the journals which formed the basis of this test, one will find occasion to apply one's knowledge of the continents in approximately the following proportions (the maximum frequency of reference being represented arbitrarily by 100):

North America.....	100	Africa.....	4
Europe.....	73	South America.....	3
Asia.....	13	Australia.....	1

The principal European countries had an importance for the readers of the journals in question in the following proportions (giving England, as the country most frequently referred to, the arbitrary value of 100):

England.....	100	Italy.....	32
France.....	80	Turkey.....	30
Germany.....	70	Austria-Hungary.....	24
Russia.....	35	Spain.....	22

The countries and colonies of Asia show the following proportions of references as compared with England: China, 55; Japan, 50; India, 19; Korea and Persia (typical of the less important divisions), 4 each.

This order of frequency in references to European and Asiatic countries is fairly constant in the two reports which furnish comparable data.

The frequency of reference to cities is perhaps not so significant, although here, too, there is a goodly measure of similarity among the different reports. A combined rating, which may mean much or little, is given herewith:

#### FOREIGN CITIES (NEW YORK, 100)

London.....	31	Constantinople.....	12
Paris.....	26	St. Petersburg.....	7
Berlin.....	15	Vienna.....	7
Rome.....	12		



## AMERICAN CITIES

New York City.....	100	Chicago.....	26
Washington.....	27	Philadelphia.....	20
Boston.....	27		

There is, in general, a direct although not a perfect correlation between the number of references to cities and the size of the cities—except, of course, that capitals of countries have an importance not always represented by their size.

Compared with references to countries and cities, the references to physical and physiographical features are not numerous. For readers of the journals used in the investigation, information about the following rivers seems to be of the greatest importance and approximately in the order named for the first five: Mississippi, Hudson, Ohio, Missouri, Rhine, Nile, Danube, St. Lawrence, Potomac, La Plata, Seine, Niagara, Rio Grande, Columbia, Amazon, Congo. References to seas and gulfs follow the following order: Mediterranean, Aegean, Mexico, Black, Adriatic, Marmora, Red, and Caspian. The straits most frequently mentioned are the Dardanelles, Bosphorus, Magellan, and Bering.

In the journals read, historical references were less frequent than geographical references. In connection with American history the presidents are more frequently referred to than any other group of historical personages, perhaps because of the advantage of associating events in our national history with presidential administrations. In the two reports in which historical data are given Lincoln easily heads the list as the American personage most frequently referred to, having a higher frequency of reference, indeed, than any living person. The following table includes the names of the persons (not now living), prominent during the period of national history, in the order of the frequency of reference in the two reports; the order, however, is not significant beyond the first six (Lincoln is given an arbitrary value of 100):

Lincoln.....	100	Cleveland.....	17
Washington.....	66	McKinley.....	17
Jefferson.....	51	Webster.....	13
Jackson.....	24	Franklin.....	10
Grant.....	20	J. Q. Adams.....	10
Clay.....	20	Buchanan.....	10



In both reports references to wars are more frequent than references to any other single type of historical event, the Civil War easily leading in frequency of reference.

To the readers of the journals in question a very significant importance attaches to an understanding of the federal government. The most important topics appear to be, in the order of frequency of reference: (1) the Constitution itself; (2) the amendments to the Constitution; and (3) the constitutional convention. The number and character of references is especially noteworthy in connection with the large emphasis that has been laid in recent textbooks on the "critical period" in American history. Some suggestions as to the important points of emphasis in the study of civics are embodied in the frequency of references to the powers of Congress, to the different functions of the Senate and the House, and to the administrative departments. The departments stand in the following order of frequency in the references: (1) Department of State; (2) Department of the Interior and Attorney-General's office; (3) Departments of the Treasury and of War; (4) Post-Office Department, and Departments of Commerce and of Agriculture.

In one of the reports, which involved a reading of samplings from a general and rather "popular" magazine covering a period of ten years, there are some suggestions as to the characters and events of world-history with whom (or with which) a speaking acquaintance is perhaps necessary if one is to read such literature intelligently. Of the personages, Napoleon easily heads the list, and the number of references to him, even in this popular magazine, suggests the importance of emphasizing the more important facts of his career at some point during the elementary course in United States history, preferably during the study of the events leading to the War of 1812. Among the other figures of world-history whose names recur with some measure of frequency are Caesar, Louis XIV, Jeanne d'Arc, and Luther. As a commentary on those criticisms of the present-day teaching of history which hold that too much attention is given to the past and too little to recent and contemporary events, it is interesting to note that, in the samplings from ten volumes of this popular American magazine, Caesar is referred to more frequently than any American character except Lincoln, Washington, and Roosevelt; Jeanne d'Arc as often as Cleveland; and Napoleon more frequently than any living political or military character.

Certain critical events or epochs of European history are also referred to with sufficient frequency to suggest the importance of furnishing some information regarding these events in connection (as is readily feasible) with contemporaneous or related events of American history. The most important of these are, in the order of their frequency of reference: the Renaissance, the French Revolution, the Middle Ages, and the Elizabethan period.

While literary references were not included within the scope of the reports, they were collected by one of the readers. In the samplings of the ten volumes of the popular magazine above referred to, Shakespeare's name is mentioned more frequently than that of any other person of any group or age. Other names that recur in the literary group are Victor Hugo, Tolstoi, Burns, Homer, Carlyle, Samuel Johnson, Ibsen, Kipling, and Shaw; and, among Americans, Holmes, Mark Twain, and Howells. Of references to the works of literature, the most frequent are to the plays of Shakespeare, especially the *Merchant of Venice*, *Hamlet*, *Romeo and Juliet*, and *Macbeth*. Of recurring terms that have their source in imaginative literature, the following deserve mention: Lilliputian, Utopia, Utopian, Pickwickian, Rip Van Winkle, Helen of Troy, Shylock, Falstaff, and Gulliver.

It is quite likely that the frequencies of reference given in the foregoing tables would vary with different types of journals, although, as has been suggested, there was a striking resemblance among the three reports which represented, in all, samplings of the *Literary Digest*, the *Outlook*, *Collier's*, the *World's Work*, the *Cosmopolitan*, and the *Review of Reviews*. The earlier work done with newspapers is not included in these reports. The weekly and monthly journals offer much better advantages for applying the method, and it is not probable that anyone would object to the assumption that the work in geography and history in the seventh and eighth grades should fit the pupil to read intelligently such journals as the *Outlook* and the *Literary Digest*, in so far as these journals employ references and allusions to geography and to United States history.

An extended investigation covering forty or fifty periodicals of various types and representing a period of at least ten years would certainly form a basis for an interesting comparison of the frequencies with which places, events, and personages are referred to; and this

comparison might possibly form one index of the relative educational value of the different items of information. Our initial investigations show that the comparisons can be stated in definite quantitative terms; but whether, once these relationships are stated definitely and quantitatively, relative educational values are thereby indicated with the same quantitative certainty is quite another question. The difficulty lies in the fact that both geography and history in the elementary school have other functions to fulfil in addition to providing an interpretive basis for the intelligent reading of current literature, and a method which furnishes very definite standards of value in respect of a single function may do marked injustice to other functions. Before extended modifications are made upon the basis of a single standard, therefore, it would be essential to come to some agreement as to the various functions that a subject should attempt to fulfil.

An extended investigation upon the basis of magazine and newspaper references would probably be worth the cost. It would, however, involve more work of a routine character than could be asked of graduate students. Hence the limitation of our "investigations" to a "trying-out" of methods.

#### B. JUDGMENTS OF SPECIALISTS AS A MEANS OF DETERMINING MINIMA

A second method for determining minimum essentials is to collect the judgments of special students of the subjects under discussion. This method was applied by Mr. J. E. Wooters in determining the dates and events that may profitably be memorized in the seventh and eighth grades. The investigation was undertaken as part of the work of the seminary mentioned above. The results were published in *School and Home Education* for December, 1914. A questionnaire was submitted to 150 members of the American Historical Association, inclosing a list of 52 dates, and requesting that the 20 most important dates in this list be arranged or "ranked" in the order of their importance, and that other dates not given in the list be inserted if, in the judgment of the person making the reply, these other dates were more important than any given in the list. Eighty-six replies were received to this questionnaire, and of these 49 were used in making the final computations. Every date given first rank on a question-sheet was given a value of 20; every date given second place was given a value of 19; and so on.

The 20 dates which resulted from these combined ratings, and the combined value accruing to each, were as given in Table I.

TABLE I

Rank	Date	Value	Rank	Date	Value
1.....	1776	1,323	11.....	1812	752
2.....	1492	1,261	12.....	1765	629
3.....	1607	1,163	13.....	1783	618
4.....	1789	1,100	14.....	1865 (April 14)	389
5.....	1620	961	15.....	1850	591
6.....	1803	955	16.....	1854	590
7.....	1861 (April 14)	901	17.....	1775	585
8.....	1787	821	18.....	1781	584
9.....	1863 (January 1)	808	19.....	1823	526
10.....	1820	793	20.....	1846	470

An accumulation of similar rankings from a larger number of specialists in history would doubtless result in some slight variations from the order in the given table; it is not likely, however, that the modifications would be at all significant. It is noteworthy that the lists submitted by some of the most eminent of the historians who consented to make the rankings corresponded almost precisely with the final combined list; Professor Edward Channing's rankings, for example, included each of the dates above given, and in the same order with two or three unimportant exceptions. Professor A. B. Hart's rankings were also closely parallel to those given above.

How many dates and events may be profitably associated through automatic memory as a part of the history work in the elementary school is a question that this investigation does not attempt to answer. It was the opinion of the large majority of those answering the questionnaire that a certain number of these automatic associations are essential. An attempt to fix too many will doubtless result either in an excessive amount of drill on dates or in an inadequate mastery of the most important. The problem would seem to be, then, to have the dates listed in the order of their importance, leaving the minimum requirements to be determined by another type of investigation. The writer is personally convinced that twenty may be profitably accepted as a tentative minimum for thorough mastery. This number is smaller than that proposed by the Minnesota report on elimination<sup>1</sup> which gives a list of

<sup>1</sup> "Report of Committee on Elementary Course of Study," *Bulletin No. 51*, Minnesota State Department of Education.



thirty-seven dates—without, however, stating the principle upon which they have been selected.

Mr. Wooters also asked in his questionnaire for judgments regarding the laying of certain other automatic bases in seventh- and eighth-grade history. Out of 70 specialists in history who replied to the question, 49 thought it advisable to have the names of the presidents memorized in the chronological order of their administrations. The importance of making this requirement is also suggested by the results of the newspaper-magazine investigations referred to earlier in this report. In answer to the question, "Should any part of the federal constitution be memorized?" 39 out of 68 who replied answered "Yes." The Preamble and Article I seemed to be the parts most frequently indicated as suitable for memorization. In answer to the question, "Should any part of the Declaration of Independence be memorized?" only 30 out of 67 replying answered "Yes."

The present writer is convinced of the general validity of this method of appealing to special students of the subjects under discussion for judgments regarding the educational value of different topics and items. He would hold, indeed, that every attempt to determine relative values or minimum requirements should involve such an appeal. The facilitating of judgment by asking for "rankings" is an especially valuable feature of the general procedure. It will be essential to check the results obtained through an application of this method by investigations of other types, for unfortunately, as the replies to Mr. Wooters' questionnaire sufficiently indicate, many special students of history have given little attention to the problem of teaching history in the elementary school, and seem indeed quite impatient toward anyone who suggests that a special problem of rather large magnitude is here involved.

#### C. A COMPARISON OF SCHOOL TEXTS AS A METHOD OF DETERMINING PRESENT-DAY MINIMA

The results of the newspaper-magazine investigations referred to above suggested to the writer the importance of knowing what topics in geography and history have been common to the elementary courses in the immediate past and what topics are common to such courses today. If any modifications are to be made they should certainly be made upon the basis of this knowledge. If a fact or a group of facts has been an ingredient of the common pabulum of universal education for a school generation or longer the presumption is in favor of retaining it,



or at least of modifying it only very gradually. An important function of the "informational" or "content" subjects of the elementary program is to insure a common basis of ideas and knowledge among all of the people. This is all the more important in a democracy, for democratic government involves the collective consideration of common problems, and it is essential to this end that there be a goodly supply of ideas and information common to all of the members of the democratic group. An idea or a fact or a bit of information about a historical event has its value greatly enhanced if it is a matter of common knowledge; it becomes thereby a possible point of reference in collective thinking—a common denominator in the exchange of experience. In the light of this contention, the facts, ideas, and items of information that have been and are the common property of the great majority of the people assume a large significance to the student of educational values.

At the beginning of the present academic year the writer undertook with his graduate seminary an analysis of 24 textbooks that have had an extensive use in the seventh and eighth grades. These books are being carefully compared as to scope of treatment, amount of space devoted to different topics, and style of treatment. Inasmuch as the texts represent each decade since 1860, it has been possible to note the changes that have taken place in the content of elementary history during the past fifty years. The plan of investigation contemplates a determination of the various topics treated and the relative emphasis given to each as represented by the proportion of the entire book devoted to its discussion. It is a fair assumption that the emphasis in teaching generally follows rather faithfully the emphasis indicated by the text; hence a determination of this sort will indicate more clearly than any other practicable method the actual content of the historical instruction. Certainly it is much more trustworthy as an index of past and present "tendencies" than the conclusions drawn from comparing courses of study or school manuals.

This investigation has not as yet been completed, and the results will not be ready for publication prior to the coming summer. A few of the data that have already been tabulated may serve to suggest in a general way the possibilities of the method. It is the intention to continue this procedure with a similar analysis of geographical texts.

An important movement in the last two or three decades in the teaching of elementary history has been to lay less stress upon military affairs,

and to give more attention to social and industrial development. The general tendency is well represented by the tabulations in Table II, showing the relative emphasis that has been and is being given to certain important epochs in American history as indicated by the proportionate amounts of space given to the discussion of the various epochs in the different texts.

TABLE II

AVERAGE PROPORTION OF SPACE OF ENTIRE BOOK DEVOTED TO VARIOUS PERIODS

Period	In Four Books Published from 1860 to 1875	In Four Books Published from 1875 to 1890	In Seven Books Published from 1890 to 1905	In Seven Books Published since 1905
Colonial wars.....	5.3 per cent	4.2 per cent	3.7 per cent	3.6 per cent
Pre-Revolutionary period (1763-1775)...	3.1 " "	1.9 " "	3.6 " "	3.9 " "
War of the Revolution 1783-1812 (including "critical period")...	18.0 " "	15.3 " "	11.6 " "	10.0 " "
War of 1812.....	5.7 " "	9.1 " "	11.1 " "	13.5 " "
Civil War.....	5.9 " "	3.2 " "	3.9 " "	3.2 " "
	15.0 " "	13.1 " "	11.9 " "	10.5 " "

Not only has the proportion of space devoted to wars generally (and, for the major wars, steadily) decreased, but the treatment of war in the school histories has been modified, less attention being given in the more recent texts to the details of battles and campaigns and more attention to the causes of the wars and to social and economic conditions as influenced by the wars.

The treatment of the period of national expansion and growth covering the years 1814-61 is also more extended and detailed in the later texts than in those published twenty and thirty years ago. The proportion of space given to colonial development remains approximately the same. Perhaps the most significant increase in emphasis is represented by the figures in Table II, showing the proportionate space devoted to the "critical period."<sup>1</sup> When the more specific topics are tabulated, the increase of emphasis on industrial and social history will doubtless be clearly revealed.

The names of persons associated with the various periods are particularly significant from the point of view of minimum essentials. It

<sup>1</sup> The Minnesota report on desirable eliminations recommends (p. 6) that the use of the term "critical period" be discontinued, but the reason for the recommendation is not given.

may be truly said that there is no "Hall of Fame" that can compare for a moment with the common pabulum of the elementary program. If a name finds a niche here, it should certainly deserve the honor. As a matter of fact there are wide variations in the number of historical characters referred to in the different texts, and only a very narrow range within which all texts are in substantial agreement. This is clearly shown in the following tabulations.

For the period of exploration and discovery, a total of 109 different names are mentioned in 22 different books, the most common number being between 34 and 39. Of this total, however, only 4 are found in all of 22 books. Giving these an arbitrary value of 100 each, the principal characters of the period in question assume the following degrees of importance *as measured by this standard*:

Columbus.....	100	Cortez.....	82
John Cabot.....	100	Virginia Dare.....	82
Balboa.....	100	De Soto.....	77.5
Raleigh.....	100	Verrazano.....	77.5
Vespucci.....	95.5	Menendez.....	77.5
Drake.....	95.5	White.....	77.5
Queen Elizabeth.....	95.5	Narváez.....	77.5
Sebastian Cabot.....	91	King Ferdinand.....	77.5
Ponce de Leon.....	91	Cartier.....	77.5
Queen Isabella.....	91	Leif Ericsson.....	73
Gilbert.....	86.5	Gosnold.....	73
Magellan.....	82	Henry VIII.....	73

For the period of colonial growth, 200 different names are found in different books, the average number of names in each book being 50. Only 9 names are found in all of the books: John Smith, John Winthrop, Peter Stuyvesant, William Penn, Roger Williams, Edmond Andros, William Berkeley, James Oglethorpe, and George Carteret. The following additional names are found in 19 out of the 21 books: Nathaniel Bacon, Pocahontas, King Philip, George Calvert, John Berkeley.

In connection with the French and Indian War a total of 109 different names are found in 23 books, but of these only 3 are common to all: Washington, Braddock, and Wolfe; while a fourth, Montcalm, is missing in but one.

The pre-Revolutionary period gives a total of 79 different names in 23 books, with only one name found in all—Patrick Henry. James Otis,

William Pitt, and Gage find a place in 19 out of the 23 books and Samuel Adams in 17.

The War of the Revolution involves in 21 books a total of 252 different names, with only 7 common to all, and others arranged on a percentage basis as follows:

Washington.....	100	Howe.....	95
Greene.....	100	Schuyler.....	90
Gates.....	100	Allen.....	85
Arnold.....	100	De Kalb.....	85
Cornwallis.....	100	Morgan.....	85
Gage.....	100	Tarleton.....	85
Lafayette.....	100	Lincoln.....	85
Franklin.....	95	Warren.....	80
Jones.....	95	Putnam.....	80
Stark.....	95	Montgomery.....	80
Wayne.....	95	J. Adams.....	80
Charles Lee.....	95	Pickens.....	80
Marion.....	95	R. H. Lee.....	75
Jefferson.....	95	Pulaski.....	75
André.....	95	Clinton.....	75
Burgoyne.....	95	Prescott.....	75
Sumter.....	95	Sullivan.....	75

The period 1783-1812 gives a total of 93 different names in 18 texts, the usual number in each book being about 24. Common to all of the books are the names of the four presidents serving in this period (Washington, Adams, Jefferson, and Madison), and, in addition, Jay and Hamilton. Napoleon, Aaron Burr, and Tecumseh are referred to in 15 out of the 18 books.

The period 1812-1861, while rich in names mentioned, shows a very small proportion common to all texts. In addition to the names of the presidents, the only names found in all of 23 texts are O. H. Perry. Winfield Scott, Henry Clay, John Calhoun, J. C. Fremont, and John Brown. Isaac Hull, Webster, Douglas, and Dred Scott find a place in 21 texts.

The period of the Civil War shows a much higher proportion of names common to all of the texts. In 22 books, 21 names are common to all. These are: Lincoln, Anderson, Beauregard, Jackson, McDowell, McClellan, Rosecrans, J. E. Johnston, A. S. Johnston, Burnside, Buell, Thomas, Grant, Farragut, Davis, Sherman, Lee, Hooker, Meade,

Early, and Sheridan. In 21 books the following additional names appear: Bragg, Mason, Slidell, Pope, and Hood.

Much more significant than the names of persons common to the school histories are the topics that are common to all of the texts and the proportion of emphasis given to each topic. Once these data are tabulated we shall know with a fair degree of precision what the common pabulum of the elementary curriculum in respect to history has been in the immediate past, what it is today, and what changes have been made within the last fifty years. In the opinion of the writer, it will then be possible to proceed with measures that may determine from various points of view the additions or eliminations that may be necessary or desirable.

The following graduate students are aiding the writer in this analysis of texts: Misses Bernice Harrison, Margaret Cobb, Olive Paine, Mali Lee, Helen Clark, and Elizabeth Fuller; Messrs. H. Johnston, H. O. Rugg, and A. J. Beatty.



## CHAPTER X

### THE ESSENTIALS OF LITERATURE

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As supplementary to the chapters on reading and on language and grammar, the following short statement concerning the essentials in the study of literature in the elementary school is offered. A confessedly inadequate treatment is worth while if for no other purpose than to emphasize the fact that literature should be regarded as one of the principal content subjects in the school. Much of the reading, it is true, is, and should be, of a literary character, but the early stages of primary reading must necessarily involve definite attention to graphic forms, and the work which follows should be devoted in part to training children in the reading of books of scientific and matter-of-fact character. As matters stand, moreover, the selections found in the reading-books are often mere excerpts from longer pieces and cannot possibly take the place of complete works of art from the point of view either of fulness of impression or of power of sustained attention. There should be, and in a large number of the schools in the country there is, a continuous course in literature both in prose and in verse from the beginning of the first grade to the end of the eighth.

It is not likely that too much time is devoted to literary masterpieces in any of our elementary schools. The problem of economy is one of selection and method of treatment. For almost a generation a sifting process has been going on which seems to have resulted to a remarkable degree in unanimity of choice of literature for the elementary school and even of uniformity of grading. This appears in two interesting studies made at the University of Chicago under the direction of Assistant Professor J. F. Bobbitt and published in the *Elementary School Teacher*.<sup>1</sup> Some fifty courses of study from representative cities and towns were examined as to the stories and poems included and the

<sup>1</sup> XIV, Nos. 4 and 5, December, 1913, and January, 1914.

grades to which the various selections were assigned. In the lists of longer readings—books, long stories, and longer poems—138 authors represented by 296 titles were found. Of these, 183 titles appeared four or more times in the fifty courses, while a number of selections were named as many as twenty-five or even thirty times. From the entire list a selection by grades was made of the titles appearing nine times or more. This ought to be of very great value to any course-maker in determining what pieces are most likely to be of most value in certain grades in his own school.

The titles of the literary selections most frequently memorized in the elementary school were taken from thirty-four state, county, and city courses of study, including Hosis's *Elementary Course in English*. Eight hundred and thirty-four titles were counted, and by eliminating all appearing less than three times, it was found that 140 authors were represented by 383 titles. These were then arranged in two tables, the first alphabetical by authors and the second alphabetical according to the grades for which the poems were most often recommended. As in the case of the longer readings, this second table supplies a list of well-tried selections for each of the eight grades and might well be made the foundation for a course in any school.

There remains the question whether there are any fundamental principles in accordance with which selection may be made of the most useful poems, stories, and plays to be taught to children. It is the function of literature to serve as the artistic interpretation of life. It is, throughout, the expression of human interests, human emotions, and human nature. By means of it children are to come to appreciate the ideal elements in life and nature and by means of it their aspirations are to be shaped, their feelings refined. It would seem, therefore, that the choice of literary material for school use should depend upon the power of appeal and enduring value of the content of the selection under consideration. One must take into account also the maturity, subtlety and scope of ideas, as well as the need of a balanced ration.

With such a point of view a committee of principals and teachers in the city of Chicago undertook some years ago to compile a classified list of poems and stories for the grades. Some of the headings which were used were as follows: "Home and Community," "Ideals of Life and Conduct," "Physical Nature," "Rhyme and Nonsense," "Songs," and in the case of prose pieces, "Household Tales," "Wonder Stories,"

"Heroism and Romance." Everyone will see the danger of such a definite classification. It may of course narrow the view of a given selection; it may lead to didactic treatment; and it cannot in any case be exhaustive. It may, however, suggest the chief value of a given selection, and above all it may serve to secure for the children a variety of experience with literature.

A somewhat similar outline of the work in literature was prepared about the same time (December, 1902) by Miss Mary McSkimmon for the schools of Brookline, Massachusetts. She selected an ethical center for each grade and made a list of stories, poems, and entire books to go with these. These ethical centers were as follows:

Grade I. The Love of Home and the Duties of Children Therein.

Grade II. The Love of Animals, and the Responsibility for the Care and Happiness of Pets.

Grade III. Love for One Another; the Child as an Individual Member of the Human Brotherhood.

Grade IV. The Duty of Self-Control.

Grade V. Courage: the Duty of Purposeful, Heroic Effort.

Grade VI. Obedience, and Service Rendered through Obedience.

Grade VII. Wisdom: Service through Knowledge and Goodness.

Grade VIII. Patriotism: the Character of a Good Citizen.

Grade IX. Service through Character.

The difficulty inevitable in such a plan is, of course, that of finding material within the comprehension of the children of the various grades. There is danger also that pieces that ought to be taught will fall outside the scheme. The list selected by Miss McSkimmon is, however, very good and may well serve to emphasize the importance of including in any list of literary material for children a number of pieces the spirit of which is distinctly ethical. This must not imply a didactic treatment in the classroom.

Very little experimentation or really scientific study seems to have been undertaken in the field of children's literature. Two examples are to be found in British publications. In the *Journal of English Studies*<sup>1</sup> appeared recently a series of short poems and selections from poems representing a sort of scale of literary excellence. These poems were presented to different groups of students, both youthful and mature, some of whom had had literary studies in school and others not. The

<sup>1</sup> January-April, 1914.

object of the experiment was to determine whether school work in literature actually develops discriminating taste. The author of the article concludes that it does. His experiment might well be repeated by others, who should take pains to use only complete selections unless, indeed, such elements of treatment as phrasing or rhythm are to be specially considered.

The second contribution is by Professor I. Lawrence, who writes on "Children's Humour" in the *Journal of Experimental Pedagogy*.<sup>1</sup> He collected some 200 papers from several types of schools with the aim of discovering what children laugh at and how this varies according to age and circumstances. The children wrote, as unprepared compositions, accounts of the funniest things that they had heard, read, or directly experienced.

Professor Lawrence divided the papers into three groups. The first was made up of those written by very poor children ranging from ten to thirteen years of age. They found their humor principally on the street and at the "movies." The principal source was grotesque appearance and action. The second group was written by children from comfortable homes. They found their humor in the trivial incidents of current books and magazines. They showed, however, much more power of intellectual perception than the first group. The third group was written by children from fourteen to seventeen years of age who were attending an excellent secondary school. Their home circumstances were those of the upper middle class. The papers in this group were markedly individual. The young people showed a considerable development of self-realization. The laughter was critical.

Such a study as this is highly suggestive as to the kind of work which might be undertaken to discover what powers of appreciation children in certain circumstances and at certain stages of intellectual growth might be expected to have, and therefore what material could be made to appeal to them. This is not to say, of course, that they should be given only what they can understand readily, but rather what they can reach up to.

This suggests a closing word. It is undoubtedly true that much of the time now spent on the study of literature in the elementary school is wasted because of a lack of definiteness of aim and of appreciation of the values peculiar to the selections taught. The visitor to the

<sup>1</sup>II, No. 5, June, 1914.



reading class as well as to the story-hour is often impressed with the evident preoccupation of both class and teacher with a multitude of details which are not in any way related to the chief purpose of the selection. If each piece were approached with the expectation that it will have a definite impression to make and if the teacher were to bear in mind from first to last that details are valuable only as they enable this chief impression to be made effectively, the hours spent with the masterpieces of the poets and the story-tellers by our children would be many times more memorable than they usually are at present. To speak of but a single possibility, it is literature which, above all else, may instil into the mind those ideas upon which our American democratic society is founded and which bind us together as a united people.

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# THE FOURTEENTH YEARBOOK

OF THE  
NATIONAL SOCIETY FOR THE STUDY  
OF EDUCATION

PART II  
METHODS FOR MEASURING TEACHERS'  
EFFICIENCY

BY  
ARTHUR CLIFTON BOYCE  
*Sometime Assistant in the Department of Education  
of the University of Chicago*

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*Edited by* S. CHESTER PARKER

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## ANALYTICAL TABLE OF CONTENTS

	PAGE
PREFACE . . . . .	7
INTRODUCTION: NEED FOR RATING OF TEACHERS . . . . .	9-10
1. Vocational guidance of teachers	
2. Improvement of teachers in service	
3. Determination of promotion and dismissal	
CHAPTER I. PRESENT METHODS OF MEASURING TEACHING EFFICIENCY	11-28
1. Source of information	
2. Measurement by examination	
a) Purposes served by examinations	
(1) To determine entrance to service	
(2) To control promotion of teachers	
(3) To stimulate study on part of teachers	
b) Success of measurement by examination	
3. Rating of teachers	
a) General impression method	
(1) Example of the "method"	
(2) Dangers and disadvantages	
b) Argument for analysis	
c) Analytical method. Four general types	
(1) Descriptive reports	
(2) Questions and answers	
(3) Teachers rated on single items	
(4) Score cards with numerical values	
d) Summary of rating schemes	
(1) The qualities emphasized	
(2) The method of marking	
e) Discussion of rating schemes. Difficulties with present methods	
f) Use made of teachers' ratings	
(1) Private information of superintendent	
(2) Basis for salary adjustment	
(3) Determination of promotion	
(4) Improvement of teachers in service	
CHAPTER II. STUDIES OF QUALITIES OF MERIT AND THEIR VALUES .	29-41
1. "Characteristics of the Best Teacher as Recognized by Children"—Kratz	
2. "The High-School Teacher from the Pupil's Point of View"—Book	

3. "Qualities of Merit in Teachers"—Ruediger and Strayer
4. "Qualities of Merit in High-School Teachers"—Boyce
5. Studies of causes of failure in teachers
  - a) High-school teachers—Moses
  - b) Elementary teachers—Littler

**CHAPTER III. A METHOD FOR GUIDING AND CONTROLLING THE  
RATING OF TEACHERS . . . . . 42-51**

1. Need for developing scheme to control rating
2. Choice of terms for judging teaching efficiency
3. Definition of terms
4. Recording the judgment
5. A graphical method of recording judgments
6. Application of the blank to an individual case
7. Reduction of the rating to a single term

**CHAPTER IV. TESTS OF THE PROPOSED METHOD . . . . . 52-65**

1. Character of material
2. Ratings of whole schools by single judges
3. Ratings by judges at different times
4. Ratings of teachers by two or more judges
5. Differing standards of excellence
6. Differing abilities to discriminate
7. How the blank controls the rating
8. Difficulties in filling out the record
9. Summary

**CHAPTER V. RELATIVE IMPORTANCE OF QUALITIES OF MERIT . . . 66-76**

1. The problem
2. Character of material
3. Method of correlation
4. The relation of qualities of merit to general merit—correlations presented
5. The correlations examined
6. Experience
7. Validity of the correlations
  - a) Errors of selection
  - b) Errors of judgment
  - c) Errors of manipulation
8. Results compared with other studies
9. Summary

**CHAPTER VI. GENERAL SUMMARY AND CONCLUSIONS . . . . . 77**

**APPENDIX. SAMPLE SCORE CARDS FOR RATING TEACHERS . . . . . 78-83**

## PREFACE

The study of methods of measuring teachers' efficiency published in this *Yearbook* was begun by Mr. Boyce while a student in the Department of Education at the University of Illinois and was continued later while he was a student and assistant in the same department at the University of Chicago. It is one step in the process of applying methods of careful investigation to the study of a very important practical phase of school administration. Since this process of applying scientific method to practical contemporary educational problems has characterized the work of the National Society for the Study of Education, the present *Yearbook* continues the well-established publishing policy of the Society.

THE EDITOR



# METHODS FOR MEASURING TEACHERS' EFFICIENCY

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## INTRODUCTION

### NEED FOR RATING OF TEACHERS

The measurement of teaching efficiency is related to the efficiency of the school in three fundamental ways:

1. *Vocational guidance of teachers* requires a method for determining their relative merit. First, before students can be intelligently directed into the teaching profession, we must have an analysis of the qualities necessary for teaching efficiency as revealed in successful teachers. Secondly, we should have a method of analysis which would reveal the proper place for a teacher with given qualifications and the proper teacher for any given place.

2. A measuring scheme is necessary for *the improvement of teachers in service*. (a) It would serve as a basis for self-criticism and self-improvement on the part of teachers; with the standard before them, teachers need not wait till their weaknesses are pointed out by supervisors. (b) Such a standard is necessary if the supervisor's criticisms are to be complete and definite and therefore properly helpful. (c) The supervisor would not need to spend energy on all points but could concentrate on those points where the measurement revealed need for help. (d) The presence of a definite standard for efficiency would itself be a spur to improvement by laying emphasis on important points.

3. An even more effective spur to efficiency would come through the application of definite measurement to *the determination of promotion and dismissal*. (a) An important application in this connection would be to the salary schedule. The determining factors for salary adjustment are usually sex and length of service. Neither of these factors may properly determine a teacher's salary unless the school wishes to pay for something other than service rendered. Neither should the grade taught be made the basis of salary. Every grade is worthy of the teacher's best efforts. She should be paid according to her efficiency in



the place she has and should be encouraged to improve her value there instead of being encouraged to try for a different grade. (b) Some scheme of measuring teaching efficiency is needed as a basis for intelligent promotion in position. Promotion should be given to those who show promise of being more useful in the higher place. Politics and favoritism must be eliminated from the election and promotion of teachers and school officers if our schools are to be the efficient organizations they should be. (c) Finally, justice to the teachers demands that dismissals be made on an impersonal basis of proved inefficiency. Such a basis must be furnished by some method of determining efficiency which will make the cause of failure very clear.

The instrument likely to be of most benefit to the school in a proper selection of its teachers, in their improvement during service, and in properly rewarding their efforts is a measurement for teaching efficiency which shall be the basis for action in each of these important phases of the school's relations with its teaching body.

The present study is an attempt to make some progress toward meeting the needs described above, by trying to answer these questions:

1. How do school superintendents and principals determine the relative value of their teachers?
2. What are the qualities of teaching merit which should be considered in judging teachers?
3. What are the relative values of these qualities of merit?
4. What is the best way to determine the presence of these qualities in teachers?
5. What is the reliability of the judgments supervisors give of their teachers?

## CHAPTER I

### PRESENT METHODS OF MEASURING TEACHING EFFICIENCY

A study of present practice in that important part of school administration having to do with the measurement of teaching efficiency reveals the greatest diversity of method. The study also discloses a surprising number of large cities having no method at all in determining the relative specific efficiency of their teachers.

Replies from 242 representative cities in all parts of the United States are the source of our information as to methods used. Three hundred and fifty cities of over 10,000 population were asked to give us a brief statement of their methods of determining and recording the efficiency of teachers and to send us any printed rules, directions, schedules, or reports they might have in this connection.

In general, two methods are in use: examination and rating. The relative importance is shown by the following summary:

	Number of Cities Reporting
1. Promotional examinations.....	14
2. Schedule of qualities on which teachers are judged.....	133
3. Efficiency grades for teachers.....	99
4. Judgment of teachers not controlled.....	98

It will be seen that promotional examinations do not in general play a large part in measuring teaching efficiency. They are never the sole factor determining the teacher's rank but are found in combination with length of service or efficiency of service or both.

### MEASUREMENT BY EXAMINATION

*Purposes served by examinations.*—Examinations as related to teaching efficiency have three avowed purposes: (1) to determine entrance into service, (2) to control promotion of teachers from one salary group to another or from present positions to those more responsible, and (3) to stimulate continued study on the part of the teacher.

1. Entrance to service in large systems must be controlled by some such civil-service examination as will eliminate those obviously unfit. Applicants lacking the necessary academic and professional information

may be sifted out by examination. Preliminary examinations of this sort are not properly measures of teaching efficiency. They are somewhat indicative of the probable teaching ability of the candidate and determine the order in which the successful applicants are taken into the service, but ability to apply the knowledge displayed in the examination must be tested during a period of teaching, or by referring to the applicant's past experience.

2. A more real connection between examinations and teaching efficiency is found in what are usually called "promotional examinations." When these examinations are used for the purpose of selecting principals, supervisors, or other school officers from the ranks of teachers, they are not different in character from those admitting applicants to service as teachers. The examinations are simply more extended and more searching, especially in fields having to do with administration or the special branch of supervision sought.

Examinations which determine the advance of teachers from one salary group to another vary greatly in character from city to city. They may consist of the earning of credits in college extension courses or summer schools, or the presentation of theses on professional problems, or papers reviewing certain professional reading, or they may be regular examinations set on professional or academic subjects. Choice of two or more of these types of examination may be offered at the same time. Eligibility to these examinations for promotion in rank or salary usually depends on the number of years the teacher taught and the success of her previous work.

3. In all cases it is evidently the purpose of the examinations for promotion to be a spur to and a test of continued study and professional interest on the part of the teachers in service. In most instances the taking of the examinations is optional, but the fact that further increase of salary depends on it is compelling enough.

*Success of measurement by examination.*—To discover to what extent the purposes of examinations are really accomplished would require an extended investigation into those systems which employ them. Superintendents differ widely in their opinion as to their value. That examinations are negatively valuable in eliminating weak candidates for teaching and supervisory positions is no doubt true, but that they are positively valuable in determining the relative merit of teachers in service cannot be maintained with confidence. In no case, how-

ever, so far as we are aware, are promotional examinations the sole basis of judging teaching merit. The result of the more or less artificial and detached examinations is considered in connection with the actual accomplishment of the teachers in the schoolroom, however this may be measured.

One objection frequently made to promotion by examination is that it forces on the teacher an amount of study she is not always ready to undertake, that if the teacher is conscientious and doing all that she can in the schoolroom she cannot spend time and energy on outside study without damage to her health or her regular work. This objection is overcome somewhat in those cities which make very close connection between the study for examination and everyday school work. Thus Baltimore insists that the thesis written as part of the examination in that city be on a problem in which the teacher is interested in connection with her daily work. In other cities the professional reading to be reported on is perhaps no more than the teacher should do without compulsion.

This objection applies also to work done in summer schools and college extension courses. When credits for promotion are earned in this way, teachers are usually limited as to the number that may be earned in one year. A more serious objection in the minds of teachers is that the expense involved in earning credits during attendance at a summer school is frequently more than the increase in salary justifies.

The stimulus which promotional examinations give to professional reading and study along other lines calculated to keep the teacher mentally alert and up to date is no doubt very large. Superintendents report that the introduction of promotional examinations has done much for their teachers in this way.

The fact that classroom efficiency is in almost all cases a condition of eligibility to promotional examinations, and that, in all but a small percentage of school systems, success in actual teaching work is the only basis of promotion aside from years of service, shows that "proved fitness in the classroom and out of it as a unit in a working machine" is the vital factor in the promotion of teachers.

Teaching merit is almost universally determined by some sort of rating or estimation of the value of the teacher by one or more school officers who are in a position to judge her work. The methods used in rating teachers is our next consideration.



## RATING OF TEACHERS

Methods of rating teachers seem to fall into two classes, the first of which might be called the general impression method and the second, the analytical method.

*General impression method.*—We have at hand replies from approximately 100 cities which are plainly to be classed under this head. This method, if it can be called such, is doubtless characteristic of the majority of school systems and is one evidence of how little this important work of judging teaching efficiency has been systematized, rationalized, and controlled. The following quotations, taken almost at random from letters received, show very well the indefiniteness and looseness of such a method:

*Aberdeen, South Dakota.*—"We have 70 teachers, and our means of judging them is by visiting their classes and by the results they obtain in advancing the pupils under them."

*Aurora, Illinois.*—"The judgment of the superintendent as to the efficiency of the work done decides the promotion to the advanced salaries."

*Baton Rouge, Louisiana.*—"[The teachers are judged] by results obtained and opinion of principal based on observation of work."

*Berkeley, California.*—"The principal rates the teachers."

*Canton, Ohio.*—"We reappoint teachers with regular increase of salary according to schedule—provided they do good work. We decide this by visiting the school during the year."

*Champaign, Illinois.*—"Nothing but general observation. Until we can know the effect on the lives of pupils, we cannot rate the efficiency of teachers justly. I trust personal judgment."

*Charlotte, North Carolina.*—"Teachers are promoted according to their qualifications and fitness for the better position. This is left to the judgment of the superintendent and board."

*Chicopee, Massachusetts.*—"A teacher is judged by what she does or accomplishes with the material (apparatus and pupils) given her. Personal observation of her work."

*Dubuque, Iowa.*—"Nothing formal. The superintendent makes his rating, however, on the basis of the teacher's efficiency."

*Easton, Pennsylvania.*—"We have no definite plan when rating and promoting teachers except a general committee discussion at the end of the year."

*Enid, Oklahoma.*—"There are so many, many qualities which enter [into teaching efficiency] that our system has never undertaken to classify them. We take each teacher and get the product of all factors in her, without reducing her to a mathematical formula."



*Fresno, California.*—"The judgment of the principal and the superintendent is the basis of rating teachers."

*Hamilton, Ohio.*—"We have no fixed rule or schedule for rating teachers. The only question which we consider is the efficiency of her work, and this is gauged by the superintendent and principals."

*Harrisburg, Pennsylvania.*—"We have nothing of this kind except for entrance into our corps. Once in, all teachers advance automatically if good enough to retain at all."

*Iowa City, Iowa.*—"Largely the judgment of the principal and superintendent."

*Johnstown, Pennsylvania.*—"For the benefit of us supervisors, we classify the teachers at the end of the year into Excellent, Good, Fair, Failure—above based on general impressions."

*Lansing, Michigan.*—"General observation by principal and superintendent."

*Mt. Carmel, Pennsylvania.*—"Superintendent recommends promotion in salary and advises position as he sees teacher's fitness for work."

*Nashua, New Hampshire.*—"It is merely a question of judgment on the part of the superintendent."

*Newburgh, New York.*—"By observation of their work and results obtained."

*Oswego, New York.*—"Personal knowledge and observation [of superintendent]."

*Sioux Falls, South Dakota.*—"The superintendent and the principal judge the teacher by the progress made by the children under her charge."

It will be seen that the work of rating the teachers is done in one way or another by the principals or superintendents or both. The way is not specified and the judgments are apparently not controlled by any outline of factors, definitions, or rules of any kind. Any analysis of the situation is incidental and, if made at all, is made mentally and individually by the judges. The teachers are "rated" as good, bad, or indifferent, as worthy or unworthy of retention and promotion, according to the opinion of the one who judges them. There is nothing to tell what the judgment really means. No evidence is presented to support the final rating. The judge's opinion may be well grounded or not. As certain teachers under such a system declared, "The way to get promoted is to know your principal rather than your principles."

The dangers and disadvantages of such lack of method are obvious. The efficiency of the work must necessarily suffer when teachers are working to satisfy whims instead of working to attain worthy ends,

understood and set up by teachers as well as supervisors, or striving to please superior officers instead of working according to sound educational principles. The rating officer is safe if all the teachers are satisfactory and worthy of promotion, but what can he say if his judgment is called in question one way or the other, or if it disagrees with that of some other officer? There is no good evidence to give to the dissatisfied teacher or disagreeing officer. There is great opportunity for favoritism, and if partiality is not actually shown, the superintendent is in danger of being accused of it if he has nothing to show as a basis for his rating.

Moreover, one's general impression is not always to be trusted. We have evidence to show later that an officer's general impression may be modified when the teacher is studied in detail. Analysis reveals qualities of merit or demerit not realized before. The officer may be prejudiced for or against a teacher by some factor which is not vital to the teacher's efficiency. Justice to the teacher and the welfare of the school demand that the best be made of the teacher's possibilities as well as that deficiencies be discovered and corrected. "General impression" and the "indefinable something," looked for by many superintendents, can help but little in improving the teaching force.

Some superintendents, however, are firmly convinced that their personal general impression of a teacher is all that is necessary to place her correctly and that an analysis is worse than a waste of time. If no other purpose were served by rating than that of determining general efficiency or inefficiency, and if all schools were blessed with expert judges of teachers, we should not need analysis; general impressions would be enough. But it is important to know in what particulars teachers are superior or inferior if they are to be properly placed or helped. In judging handwriting it may be fairly easy for one to tell whether a particular sample is better or worse than another, but if the critic is to help the poor writer he must be able to point out specific points of deficiency. He must analyze the writing into slant and spacing and size and alignment and make his recommendations accordingly if they are to accomplish what they should. In helping poor writers, general impression is not enough. In the vastly more complicated problem of discriminating between the efficiency of teachers and in helping teachers where they most need help, general impression is very far from being enough.

Besides this, not all the school officers who are called on to pass judgment are expert judges of teaching efficiency. A schedule of qualities in the hand of the non-expert judge of teachers will not make him an expert but it will tend to make his judgments more adequate and uniform, and therefore more expert, than they would otherwise be, and will insure greater reliability. The expert will be developed by training and practice.

*Analytical method.*—In the rating schemes which attempt to analyze the teacher's efficiency and judge her in systematic fashion, one finds all degrees of complexity. Some have as few as two points to be reported on; while in others as many as 75 or 80 points are taken into account, analyzing the work most minutely.

Four general types of rating schemes can be distinguished in the hundred or more which we have collected.

1. Descriptive reports involving a written statement by the supervisory officer. Such a report may leave the supervisor free as to the points to note, or it may specify the points minutely. Thus, Oakland, California, requires Report on Teaching and Report on Discipline. In Hannibal, Missouri, the principal reports on four points, viz.: (1) Discipline, (2) Teaching Power, (3) Accuracy, Neatness, and Promptness of Record Work, and (4) Professional Spirit. Alameda, California, uses a descriptive blank with thirteen factors noted while the one reporting is aided by a list of questions under each point.

2. Racine, Wisconsin, and Middletown, New York, represent a second type in which a series of questions is asked. Most of the questions are answerable by "Yes" or "No." Some require a brief statement of fact.

3. A third type of report blank is used by Philadelphia, St. Louis, and a number of other cities. The teachers for a building are listed usually in order of general excellence. Opposite each name is placed some indication of the teacher's general efficiency and her grade in each of the few specified items. The St. Louis plan uses six topics: (1) Management of Children, (2) Instruction, (3) Attention to Details of School Business, (4) Scholarship, (5) Professional Interest and Zeal, (6) Personal Qualification. Each of these terms is defined on the back of the blank. The mark for each quality is to be the initial letter of one of the following words: Excellent, Good, Medium, Unsatisfactory.

A number of cities use a separate card for each teacher and a grade is set down opposite each quality of merit.

Dallas, Texas, presents a list of qualities with three or four descriptive adjectives following each. Those adjectives which do not describe the teacher are crossed out.

The classroom instruction card, published by the New York Bureau of Municipal Research, is widely used "as a scale for self-measurement by teachers and as a memorandum for supervisors." The card calls attention to nearly a hundred details, usually giving the critic alternative replies to be checked.

4. A fourth type is that in which definite numerical values are given to the various qualities, and subtractions made from the maximum value of any quality in proportion to the deficiency. One of the simplest of such score cards is issued by the Department of Public Instruction of the state of Indiana. The Indiana scheme has three headings:

Teaching power . . . . .	given 45 points
Government . . . . .	" 35 "
General characteristics . . . . .	" 35 "

We have at hand 10 such schemes, varying in complexity from this simple one to that proposed by Professor Elliot of Wisconsin which distributes 1,000 points over 42 separate qualities of merit.

*Summary of rating schemes.*—The qualities emphasized: Any attempt to summarize the qualities found in the many schemes proposed can be only partly successful, owing to the diversity of meaning for the same terms and difference in expression. An examination of 50 rating schemes revealed 150 factors which, however, were not all different. Thus we find six different ways of expressing Instructional Skill and ten different statements for Discipline. There is much overlapping among the qualities. As well as we could, we have combined the 150 factors and reduced them to 53, the most important 25 of which we present in Table I.

The method of marking: The terms in which teachers are reported or graded on single items, or terms in which the "efficiency grade" is given, have been obtained from 68 cities. The character of the marks and the frequency of each are given in Table II and following that the number of ranks used and their frequency.



*Discussion of rating schemes.*—Now that we have in mind the general characteristics of the rating schemes as employed at present, let us see what are the advantages and disadvantages of these devices and the difficulties presented by this method of measuring teaching efficiency.

The descriptive method of reporting a teacher's efficiency has the advantage of giving the critic great freedom in what he shall report

TABLE I

Qualities	Frequency
Discipline.....	49
Instructional skill.....	30
Scholarship and education.....	29
Co-operation and loyalty.....	30
Plan and method.....	28
Personality.....	20
Professional interest.....	16
Manner.....	15
Voice.....	14
Daily preparation.....	13
Accuracy and promptness.....	12
Professional training and preparation.....	12
Attitude toward criticism.....	12
Appearance.....	11
Health.....	11
Routine.....	11
Teacher's growth and improvement.....	10
Attitude toward work.....	10
Attitude toward pupils.....	10
Character.....	9
Tact—sympathy.....	9
Skill in questioning.....	9
Personal influence.....	9
Housekeeping.....	8
Results.....	8

but is wasteful of time and energy in the large amount of clerical work involved. Large freedom in reporting is not an advantage to all judges of teachers. The value of the report depends too much upon the supervisor's ability to bring to mind all the points which should be reported, and upon his ability to express himself easily and accurately. Unless the points on which report is to be made are carefully specified



the one reporting may easily emphasize some one point to the total exclusion of others equally important. In addition to the labor involved in making such a report and especially a large number of them, diffi-

TABLE II

Character of Mark	Frequency
Excellent, Good, Medium, Fair, Poor.....	1
Excellent, Good Fair, Poor.....	10
Excellent, Good, Poor.....	1
Satisfactory, Unsatisfactory.....	2
Below Average, Average, Above Average.....	1
Satisfactory, Fair, Not Satisfactory.....	1
Excellent, Good, Inefficient.....	1
Excellent, Good, Fair, Unsatisfactory.....	3
Excellent, Good, Fair, Poor, Very Poor.....	1
Excellent, Good, Medium, Unsatisfactory.....	2
Excellent, Very Good, Acceptable, Fair, Unsatisfactory.....	1
Excellent, Good, Medium, Poor, Failure.....	1
Superior, Strong, Good, Fair, Failure.....	1
Excellent, Very Good, Good, Fair, Poor, Very Poor.....	2
Excellent, Very Good, Good, Fair, Poor.....	3
Excellent, Good, Fair, Poor, Unsatisfactory.....	1
Good, Fair, Poor.....	1
Superior, Excellent, Good, Moderate, Unsatisfactory, Very Un- satisfactory.....	1
Perfect, Excellent, Good, Fair, Poor, Very Poor.....	1
A, B, C.....	4
A, B, C, D.....	6
A1, A, B, C.....	1
Adjectives.....	1
Percentages (values distributed).....	10
Description.....	1
Letters, <i>ad lib.</i> .....	1
Answers to questions.....	1
Figures (1, 2, 3, etc.).....	7
Number of schemes using:	
2 ranks.....	2
3 ranks.....	11
4 ranks.....	24
5 ranks.....	12
6 ranks.....	4
7 ranks.....	1

culties are encountered when the reports are made use of later. They have to be read as laboriously as they were written. There is no way in which they can be summarized quickly and accurately. There is no way in which one teacher can be compared with another with any assurance.

Reports giving answers to questions are easier to make out than the purely descriptive type since they require less time and effort for composing and writing. They are also more easily read. If the answers to the questions or the rank allotted to the teacher in a given quality are expressed by symbols such as letters or figures, still more time is saved. In each case, however, the symbols have to be translated into meaningful terms by the one using the report afterward. The difficulty of quick and accurate summation to obtain a general efficiency grade still presents itself.

Rating schemes which assign definite values to the various qualities considered are easily summated but have more serious defects of another kind. The difficulty here lies in the values and in the use made of them. First, doubt arises as to the validity of the values assigned. It is obvious that qualities of merit are not all of equal value, but who is to say how much one quality is worth in relation to general merit? Who knows whether Instructional Skill is worth  $\frac{1}{2}$  or 2 or 5 or 25 times Discipline? It is perfectly legitimate for the individual superintendent or the superintendent and his supervisors to fix upon a scale of values for the factors in question, but it would be the merest chance if the values assigned in this arbitrary manner by one man or a group of men were the true values and gave the proper weight to each factor. It is not at all likely that two men or two school systems would assign the same set of values unless one copied from the other. This complicated problem of the relative value of qualities of merit will be considered at length later in our study.

Secondly, the process of "cutting" for deficiencies is not sufficiently regulated in many cases. The values are assigned to the separate qualities but the one using the score card is not given any instructions as to how much shall be taken off if the deficiency is large or small. It will make the greatest difference whether the judge uses the whole of the scale or only the top of it. Thus if the maximum values are those of the Indiana score card and the teacher is barely passable, which one of the following scores shall she be given?

	Maximum Values	Passing Mark 90	Passing Mark 75	Passing Mark 50
Teaching power.....	45	41	34	22
Government.....	35	32	27	18
General characteristics...	20	18	15	11
	100	91	76	51

If the Indiana rule were applied she would probably receive the grade of 91, since grades above 90 are satisfactory. If 75 were the passing mark, then her grade might be cut to 76. If the whole scale were used and failure were scored down near zero, then 51 would probably be the grade assigned. Unless definite rules are established and approximately equal cuts are made for approximately equal deficiencies, ratings by different judges are not comparable and cannot be mutually understood.

The difficulty cited above is avoided in some instances by accompanying the scale of values by a scale of cuts to be made. Thus one plan in which the maximum for Teaching Skill is 20, designates that if Poor the teacher be given 12, if fair 14, Medium 16, Good 18, and if Excellent 20.

As we have said, numerical scales of this kind are easily reduced to a success grade, but they are not at all easily read in detail, and the estimate of a given detail of the teacher's work is often more necessary than a general success grade. To determine what a teacher is worth in any one particular, the grade given the teacher on that point must be compared with the maximum grade possible and then one must reflect whether the subtraction for deficiency is large or small. Unless the subtractions to be made have been prearranged and specified, the marks on individual points may be very largely meaningless.

Another criticism of rating schemes has to do with the choice of the terms which form their basis. In response to the demand for brevity, the list may be made very short, in which case, in order to cover the ground, the terms have to be very general. The value of the terms, in analyzing the teacher and her work, becomes less as the terms become more general and more inclusive. Vagueness and indefiniteness are faults too prevalent in rating schemes. The need is for terms which are definite and precise.

Indefiniteness and lack of precision can be overcome largely by careful definition, but comparatively few of the plans we have examined make use of definition.

The greatest obstacle to the operation of rating schemes of whatever kind is the insurmountable personal factor. By the very nature of the case the judging of teaching efficiency is a personal process and one which can by no means be done in a purely mechanical way. Even if we knew all the factors entering into teaching efficiency and had a perfect objective measurement for every factor, persons and personal judgment would not be eliminated. Nor is it necessary or desirable that they should be eliminated. The necessary thing is to eliminate *mere* personal *opinion*, to make sure that all the elements of teaching efficiency, so far as we know them, are given proper consideration and weight in the formation of the final judgment, and that every judgment be based on a sure foundation of facts and sound educational principles. It is further necessary that the rights of the teacher be so safeguarded by careful control and guidance of the process of judging efficiency, that no teacher may have grounds for complaint that the rating is prejudicial against her. At the same time, the good of the school must be equally protected by making it impossible for the rating officer to escape trouble or inconvenience by rating all teachers high or without discrimination.

*Use made of teachers' ratings.*—Teachers are rated principally for the following reasons: (1) for the private information of the superintendent; (2) for the purpose of furnishing a basis for salary adjustment, or to control salary adjustment; (3) for use in connection with other factors, such as length of service, examination, or special work to determine promotion; (4) to improve the teachers in service.

1. A superintendent with a large body of teachers cannot know them all in all details as he would like. His rare observation of individual teachers must be supplemented by reports of some kind from principals and supervisors. Some superintendents, however, declare that any attempt to use the ratings officially causes jealousy, hard feeling, and trouble generally because of the teacher's unwillingness to accept the rating, especially if it is low. This is declared to be even more true when the ratings determine in whole, or in part, the salary which the teacher receives.

2. In spite of the difficulties involved, the state of Indiana and numerous cities have tried to make the connection between efficiency as determined by some method of rating and salary.

The minimum-salary law of Indiana requires that the salary be based on length of service and the grades made for the certificate. "The



amount of salary per day is determined by multiplying a certain number of cents by the general average on the highest grade of license held by the teacher at the time of contracting. The number of cents to be multiplied is  $2\frac{1}{2}$  for beginners, 3 for those having had one year of experience, and  $3\frac{1}{2}$  for those having had at least three years of experience. After the teacher has taught one year, the success grade enters into the general average."<sup>1</sup>

A circular of information from the office of the superintendent of schools of Philadelphia indicates the relation of rating to salary in that city.

#### CIRCULAR OF INFORMATION

As part of the revision of the salary schedule effective January 1, 1913, when the salaries of teachers were increased, the Board of Public Education adopted the following provision:

The annual increases heretofore given to kindergarten teachers, teachers of primary grades, male teachers in grammar grades exclusively, male teachers of wood-working in the seventh and eighth grades, all other teachers of grammar grades exclusively, special classes, and elementary manual-training classes, shall cease at the expiration of the fifth year, unless the teacher who is completing the fifth year shall be certified to the assistant district superintendent of the appropriate district by the principal or supervising principal of the school as competent, and such district superintendent shall submit the same to the Superintendent of Schools for presentation to the Committee on Elementary Schools. [Rule XXXII.]

The ten annual increments provided in the schedule are thus divided into two series. The first series includes four increments, and the second series, six increments. Advancement within each series is automatic for all teachers holding permanent certificates. The rule quoted above means that no teacher can be advanced to the second series unless such teacher is certified by the principal as "competent" and such certification receives the approval both of the district superintendent and the Superintendent of Schools.

By action of the Committee on Elementary Schools, a teacher in order to be regarded as "competent" within the meaning of this rule must have received a rating of at least 80 per cent.

Teachers who, upon becoming eligible for consideration for advancement into the second series of annual increments, fail to qualify for same, will be duly considered for such advancement at the end of each subsequent year.

M. G. BRUMBAUGH, *Superintendent*

October 10, 1913

<sup>1</sup> W. C. Ruediger, *Agencies for Improvement of Teachers in Service.*



Superintendent Monroe, of Muskogee, Oklahoma, in his report for 1912-13 has this to say as to the use made of the rating blank used there, and regarding the success of its application to salary regulation:

Having once been recommended for a position in our schools by the committee and elected by the Board, teachers are practically secure in their positions as long as they render efficient service. By a system of efficiency grading teachers are automatically re-elected or dropped in accordance with the estimate of success in teaching as determined by the ratings of the supervisory officers of the Board. In accordance with the standards adopted teachers are rated at the end of the school year into classes A, B, C, and D. Those rated in the D class are dropped without question, those in the C class are dropped or conditionally re-elected, and those in the classes B and A are re-elected, the latter receiving a slightly larger increase in salary than the former. This system assures the reappointment of teachers solely on the basis of merit and efficiency. Church preference, politics, and personal pull are not permitted in any way to influence the election of a teacher or to maintain an incompetent teacher in our schools. Under this system those engaged in the supervision are responsible if unworthy or incompetent teachers are retained in the Muskogee schools. Some of our best teachers leave us every year because we are unable to retain their services at the compensation we offer, but aside from this the system inaugurated and maintained by the present Board of Education is gradually improving the teaching force of the schools and will continue the improvement so long as it is maintained.

The "Schedule of Qualifications and Salaries" of the Board of Education of Decatur, Illinois, sets forth the requirements for their teachers and the annual increments for the various classes of teachers, and then goes on to say:

Advancement from year to year until the maximum is attained shall depend (1) upon successful experience (not falling below 80 and not falling below a grade once held) evinced by the combined quantitative judgment of the supervisory force, such judgment to be expressed in written figures at least once per year, and (2) upon the continued professional growth through meeting the requirements imposed by the Board of Education (to be announced in bulletins or syllabi from time to time) in matters of study, attendance upon meetings—local, county (the teachers' institute), and state, etc.

A rank once attained may be lost if the teacher retrogrades in success or fails to evidence professional growth both in spirit and in the mastery of the study prescribed by the Board of Education.

A teacher who changes the class to which she belongs by adding to her equipment shall begin on the schedule in the new class which she enters at the

salary she drew in the old class, provided the new salary shall always be equal to or in excess of the old salary. Only official evidence of credits earned in an institution shall be considered in determining a teacher's class and her advancement in the same.

The "Salary Schedule" (sec. 4) of the Hannibal, Missouri, public schools, provides that a teacher "may not be advanced in salary if the principal's semiannual report on the last year's work done and the Superintendent's estimate leave room for doubt as to her strength in discipline, teaching, and professional spirit."

Superintendent C. C. Green, of Beaver Falls, Pennsylvania, reports the successful use of a rating scheme in controlling salary increase. The teachers there are divided into three classes, according to certificates held and experience. There is an automatic increase, for satisfactory service, of \$5.00 in each class, up to a maximum.

3. Teachers' ratings are seldom considered alone in adjusting salary. They may be combined with length of service as in the practice of Decatur, Hannibal, and Beaver Falls described above, where there are annual increments of salary up to a maximum, provided efficiency is shown by the ratings to be satisfactory.

Charleston, South Carolina, has eight grades in the salary schedule for its teachers. Advancement from Grade I to Grade VII is automatic, provided the teacher's work is reported as satisfactory. If the rating is unsatisfactory, the teacher remains in the same group another year, after which she may be dropped if still unsatisfactory. Promotions from Grade VII to Grade VIII, the highest salary group, are made "on the recommendation of the Principal and Superintendent, for special efficiency, or when put in charge of a class in the highest grade of the Elementary School. In the promotion for special efficiency, the teacher prepares a paper on a subject assigned by the Superintendent in lieu of standing an examination." A schedule of qualities is the basis of the principal's report. "The final rating is given on a personal conference between the Principal of the school and the Superintendent, and in the case of teachers in primary grades, after consultation with the Primary Supervisor. The tests given by the Superintendent during the year are also considered in the report on efficiency."

In Springfield, Ohio, an annual increase of \$50.00 is allowed to each elementary teacher, until the salary of \$750.00 is reached, subject to the following requirements: (a) Efficiency of classroom work must be

rated as Fair or higher, to be granted each of the first three annual salary increases; and Good or higher, to be granted the fourth and all subsequent increase. (b) With certain exemptions, each teacher is required to make a study each year of one book in psychology or some phase of pedagogy; one general work on the subject-matter of some school study; and some book of literary and cultural nature. (c) Exemption is made in whole or part for summer study in normal school or college, or for work done in a study club.

Columbus, Georgia, provides for annual increase up to a maximum. Further increase is according to the following regulation:

#### PROMOTIONS

After any one of the class of assistants has served one year at the maximum salary of his class, he may have a further advance of \$75.00 in the yearly salary by receiving an efficiency rating of not less than 85 per cent and passing satisfactory academic and professional tests. Notice in writing of the desire for such promotion must be given the Board one year in advance. The Superintendent and Principal of the school shall then make careful inspection of the work of such teacher and make to the Board, for the purpose of record, four reports each at regular intervals during the year. These reports will show the teacher's practical efficiency in management of children, instruction of class, and attention to school business, and will also show his professional qualities of scholarship, professional interest and zeal, and strength of personality. At the end of the year such teacher shall submit a paper of not less than 1,500 words on one of several professional topics assigned by the Superintendent and satisfactorily discuss the paper with the Board of Examiners, and shall make good an examination in three professional subjects and two academic subjects other than his specialty, if any.

Having met these requirements, the increase of \$75.00 in his annual salary shall continue through a period of four years, after which another advance of \$75.00 in the yearly salary may be had in like manner upon an efficiency rating of 90 per cent and similar tests on advanced subjects.

4. It is no doubt the intention of all the cities rating their teachers that the scheme should be a means of improving the teachers in service—directly, by pointing out weaknesses, or indirectly, through the control of the salary increase. Some cities use rating schedules only for the avowed purpose of improving their teachers. The score card of the New York Bureau of Municipal Research is one that has been widely used for this purpose (see Appendix, p. 82). The card is given to a

teacher that she may rate herself and thus, if she is honest with herself, discover points for improvement. The same scheme and others are used as a basis of supervisory criticism. The teacher knows what she is being graded on and can more easily come up to supervisory standards. Indeed, no rating blank should be used which cannot be put into the hands of the teacher. The ratings ought to be of such a character that they could be discussed with the teacher.

## CHAPTER II

### STUDIES OF QUALITIES OF MERIT AND THEIR VALUES

Discussions of the "ideal teacher" are numerous in educational literature. Every educational essayist has described that mythical creature in glowing terms. The pages of the reports of the National Education Association are full of her virtues. There is much of inspiration and suggestion in these discussions but little or nothing of scientific value, little of which a superintendent could make practical use. Each writer or speaker has described the qualities as they appeal to him, usually emphasizing one or two virtues to the exclusion of others. The great bulk of the writing on the subject of teaching merit has been of the subjective, a priori type without any basis beyond the theory and experience of the one who was writing.

Some work has been done to determine qualities of merit and their relative value in more objective and impersonal ways. There is a movement toward analysis of the qualities of teachers as they are, instead of a priori discussions of what they ought to be. If some adequate analysis can be made of the best teachers we now have and if we can determine, even roughly, the relative value of qualities of merit in them, we have advanced a little toward the stating of efficiency in scientific terms. It is our purpose at this point to examine some of these studies as preliminary to further work along this line.

The earliest investigations of this kind were built upon what boys and girls had to say about their best teachers and the teachers who helped them most. We review here two of these studies.

*"Characteristics of the Best Teacher as Recognized by Children"* (Kratz<sup>1</sup>)

It was the purpose of this investigation "to learn something of the children's ideas as to what constitutes the most helpful teacher, and what are the chief characteristics of the best teacher."

The plan was to ask the pupils of a room to recall all their teachers as fully as they could, and single out the one who helped them most. They were then asked the following questions: (1) "In what way did she help you?" (2) "Do you recall any special word or act of hers which greatly helped you? If so, what is it?" (3) "Will you write, in half

<sup>1</sup> H. E. Kratz, *Studies and Observations in the Schoolroom* (Boston: Educational Publishing Co., 1907), chap. v.



a dozen sentences, a description of the best teacher you have had, without naming her?"

There were brought together 2,411 papers from Grades II-VIII. A few of the most common characteristics are given in Table III.

TABLE III

	No.	Helped in Studies	Personal Appear- ance of Teacher	Good or Kind	Patient	Polite	Neat	Cross
		Per cent	Per cent	Per cent	Per cent	Per cent	Per cent	Per cent
II. ....	404	100	59	53	2	2	2	1
III. ....	581	100	57	52	4	5	8	2
IV. ....	511	95	68	63	9	5	11	2
V. ....	347	85	50	67	16	7	6	3
VI. ....	245	55	41	55	14	7	4	5
VII. ....	157	40	74	45	14	2	9	2
VIII. ....	166	39	64	38	22	3	11	0
Total. ....	2,411	.....	58	55	9	7	4	2

In answer to the first question, "How did she help you?" the lower grades mentioned such things as, "to be good," "to study," "to like school," "to be polite," and the like, while the higher grades said, "to observe," "to control myself," "to strengthen my character."

The question about special acts of the teacher which helped the pupils brought out "a deep sense of appreciation of words of encouragement and commendation," and appreciation which was manifested "to a greater degree than anticipated in higher grades."

"In every grade, except one, more than half of the pupils gave prominence to the teacher's dress and personal appearance."

Patience was highly appreciated. Politeness was frequently referred to. Neatness of the teacher's dress and also of her desk was a trait many recalled.

Mr. Kratz gives numerous quotations from papers of individual pupils which are interesting as showing how hard it is for teachers to conceal their failures and shortcomings from the children. The study has in it much food for thought for careless teachers as well as for those who would be favorites with grade children.

The investigation is of little importance for our present purpose of determining values of qualities of merit but it is suggestive and a step in the right direction.

"*The High-School Teacher from the Pupil's Point of View*" (Book<sup>1</sup>)

Mr. Book's material for this discussion of the high-school teacher came from 1,067 Senior high-school students who were asked by their teacher of English to write a composition on "High-School Education." One of the points to be discussed freely was "some sympathetic teachers I have had in the high school, or the reverse." The sympathetic teacher is defined in the pupil's own words as "the favorite teacher," "the teacher best liked," "the one who is respected and loved by all," and in other similar terms. What the pupils say about their teachers is given under three heads: (1) their character, (2) their qualifications, (3) what they did.

#### 1. The favorite teacher's character:

One hundred and forty-four said their favorite teacher was *kind, forgiving, and generous*. These qualities were most often emphasized.

One hundred and twelve students said more emphatically that their most helpful teacher was *pleasant, cheerful, good-natured, happy, even-tempered, and sociable*.

A third group of adjectives, used to describe 104 of the ideal teachers included the following: *patient, considerate, thoughtful of the feelings of their pupils, reasonable, not cranky, not over-particular or unreasonably strict*.

"Fifty-nine pupils especially liked teachers who were *firm, decisive, business-like, and strict*.

"Forty-six of the sympathetic teachers discussed [all described by girls] were said to be especially *inspiring, easy to approach, and the like*."

"Twenty-six students mentioned the fact that their favorite teacher was *serious, earnest, rather dignified, unassuming, and quiet*."

"A few teachers were said to be *good, polite, courteous, or refined*. *Hypocrisy* is especially disliked while *sincerity* is highly commended."

"Lastly the sympathetic teacher was described as wholly *unselfish and self-sacrificing*."

#### 2. Qualifications described:

(1) The favorite teacher *understands boys and girls*.

(2) Another qualification from the point of view of the students is that the teacher be *enthusiastic, energetic, young*. By *young* the pupils do not mean so much an age distinction as one of mental attitude. Being *young* means being enthusiastic, full of life, up to date.

(3) To be recognized as an ideal teacher one must be *interested in work*.

<sup>1</sup> W. F. Book, *Pedagogical Seminary*, XII, 239-88.

(4) Another essential qualification is *scholarship*, but one must not be a narrow specialist.

(5) No definite *sex qualification* is made.

(6) Neither was any *appearance qualification* made. This is in contrast with Kratz's study of grade children, in which it was found that neatness and appearance were important qualifications. Says Book, "High-school pupils seem not only to appreciate but to be accurate judges of a teacher's real worth."

3. What the favorite teacher does:

"Two hundred and eleven teachers were chosen as favorites chiefly because they were always ready and willing to give their pupils the right sort of encouragement."

"In all his dealings and intercourse with his pupils the favorite teacher is *reasonable, fair, and just*. Justice received special emphasis." The teacher allows for individuality.

"The pupils' favorite teachers have confidence in their students, put them on their honor, believe in them, and trust them."

The pupils like a teacher who "takes an interest" in them outside of school, as well as in.

The favorite teacher makes the class work pleasant and interesting, by clear explanations, originality, much free discussion, and by his attitude and manner.

In general, the author's conclusions are as follows:

1. Pupils demand constant direction and encouragement, which only teachers with certain definite qualifications and qualities of character are able to give.

2. The common virtues and the more fundamental qualifications are the ones which most appeal to high-school students.

3. The teacher's ability to understand boys and girls is of primary importance.

4. Boys and girls require different treatment but in the main they like teachers with much the same characteristics.

5. Sex is not a vital factor.

There is no hint in these two studies of any possible quantitative relation between the qualities of merit. The discussions are all in general, qualitative terms such as the children suggest. Their value lies in the fact that they make an effort to get at the real qualities of real teachers and do give some basis for action. The studies are limited by the fact that the children whose impressions they summarize are not able to analyze the teacher very minutely or to

give anything beyond certain personal characteristics of their "favorite teacher."

The fuller analysis must be made by superintendents and others who know teachers more intimately on the professional side and who are able to state in more exact terms the differences they find in teachers. Furthermore, the statement that one quality is more valuable than another leads to the question, How much more? It is necessary to introduce quantitative relations.

The later studies have tried to do this by appealing to superintendents for information and attempting to determine the quantitative relations by statistical method. The success of these efforts will be indicated by the investigation which we review below.

"Qualities of Merit in Teachers" (Ruediger and Strayer<sup>1</sup>)

These investigators had a number of principals and superintendents rank their teachers, first according to General Merit, and then according to each of ten possible factors of General Merit. They secured information as to the grade taught, preparation and experience of each of the teachers ranked. Returns from 26 schools were used.

Correlations between General Merit and each of the specific qualities of merit were made by the method of Woodworth's Percentage of Displacement. The results are condensed in Table IV which is rearranged to give the qualities in what appears to be the order of their importance.

TABLE IV

General Merit	No. of Cases	Range	Median	Average	M.V.	R.E.	Pearson
1. Control or ability to keep order.....	25	0-100	22	22	12	11	56
2. Teaching skill; method.....	26	0-70	17	23	15	13	54
3. Initiative or originality.....	26	4-53	25	25	11	8	50
4. Strength of personality.....	26	0-70	25	27	13	11	46
5. Progressive scholarship or studiousness..	24	0-53	30	28	12	11	44
6. Ability to carry out suggestions.....	24	0-50	25	29	10	10	42
7. Accord between teachers and pupils....	26	0-60	33	31	10	10	38
8. Experience in years.....	25	10-60	29	32	11	8	36
9. Social factor outside of school.....	23	10-66	36	36	11	7	28
10. Personal appearance.....	24	10-61	44	40	10	7	20
11. Health.....	18	6-67	50	48	10	7	4

<sup>1</sup> *Journal of Educational Psychology*, I (May, 1910), 271.



The following manipulation of the correlation coefficients has been suggested to indicate the values of the factors relative to each other.<sup>1</sup>

TABLE V

General Merit	Control	Teaching Skill	Initiative	Personality	Studiosness	Carrying Out Suggestions	Accord	Experience	Social	Appearance
Teaching skill	1.04									
Initiative....	1.12	1.08								
Personality..	1.21	1.17	1.08							
Studiosness	1.27	1.23	1.13	1.05						
Carrying out suggestions	1.33	1.28	1.19	1.09	1.05					
Accord.....	1.47	1.42	1.31	1.22	1.16	1.10				
Experience..	1.55	1.50	1.39	1.28	1.22	1.17	1.06			
Social.....	2.00	1.92	1.78	1.64	1.57	1.50	1.35	1.28		
Appearance .	2.80	2.70	2.50	2.30	2.20	2.10	1.90	1.80	1.40	
Health.....	14.00	13.50	12.50	11.50	11.00	10.50	9.50	9.00	7.00	5

It will be noted that Control and Teaching Skill are the most important items in this list, while the physical qualities of Health and Appearance stand lowest. Whether or not the qualities stand in the exact relation shown by the table is of course extremely doubtful. Only extended and prolonged experimentation can establish it. That such a relation may be found, however, is indicated by this and other studies.

The value of experience in modifying teaching ability is discussed by Professor Ruediger, as follows:

The positive correlation between length of service and general merit is significant. The correlation is indicated by several other comparisons that we have made. The teaching experience of the 204 teachers from whom data were supplied under this head ranged from a fraction of a year to 34 years, with an average of 10 and a median of 8; 25 per cent had taught less than 5 years, while 26 per cent had taught over 14 years. The average and the median number of years taught by the teachers ranked first were, respectively, 14 and 10.5 years, and for those ranked second, 12 and 10.5 years. No teacher ranked either first or second had taught less than 5 years, and only 4 per cent had taught more than 25 years. The average number of years taught by those ranked lowest was 8 years and by those ranked second lowest 9 years. The medians for these were, respectively, 4.5 and 6 years. When the two

<sup>1</sup> *School Review Monographs*, No. V, p. 18.



oldest teachers are removed from the lowest group, the average drops to 6 years; and when the oldest is removed from the second lowest group, the average drops to 8 years. These three teachers had taught, respectively, 24, 30, and 32 years; 70 per cent of the teachers in the first rank, 60 per cent of those in the second rank, 40 per cent of those in the second lowest rank, and only 30 per cent of those in the lowest had taught 10 years or more. This indicates either that teachers keep on improving and passing to higher ranks for at least 10 years or that the poorer teachers are gradually eliminated from the service. Both factors may play a part. From the figures as a whole one may infer that a teacher in the grades reaches first-class efficiency in about 5 years, that he maintains this efficiency for about 20 years, and that after about 25 years of service he begins to decline.<sup>1</sup>

*"Qualities of Merit in High-School Teachers"* (Boyce<sup>2</sup>)

Following the above-named study of the elementary teacher by Ruediger and Strayer, the writer made a similar investigation in the secondary field. In this case a list of 21 possible factors of teaching efficiency was presented to over 200 superintendents and high-school principals, with the request that they rank their high-school teachers, first according to General Merit and then according to each of the separate qualities of merit. Reports from 27 schools were made use of.

The method of correlation used in determining the relation of each quality to General Merit was that indicated by the formula:

$$r = \cos \frac{\sqrt{bc}}{\sqrt{ad} + \sqrt{bc}} \pi$$

in which  $a$  equals the number of cases in which individuals are above the median rank in both of the qualities compared;  $b$  equals the number of cases in which individuals are above in the first quality and below in the second;  $c$  equals the number of cases in which the individuals are below in the first quality and above in the second;  $d$  equals the number of cases in which individuals are below in both qualities.

In those classifications where the Pearson coefficient has not been worked out, the teachers were divided arbitrarily into three classes, Good, Medium, and Poor. By Good is meant those ranked first or

<sup>1</sup> U.S. Bureau of Education Bulletin No. 3, 1911, "Agencies for the Improvement of Teachers in Service."

<sup>2</sup> "Qualities of Merit in Secondary School Teachers," *Journal of Educational Psychology*, March, 1912.

second; by Poor, those ranked last or next to last; by Medium, all others between these two. Because teachers are ranked last or next to last does not necessarily mean that they are really poor teachers. It simply means that of all the teachers with whom they were compared they were least good. It seemed safe to make this classification because in any one quality it is quite likely that one or two teachers would be prominent either for the presence or absence of that quality, while it might be more difficult to distinguish between the others.

In regard to the relation of sex to teaching efficiency we had data on 154 male and 250 female high-school teachers. Comparisons are very slightly in favor of the women. It was possible for 62, or 40 per cent, of the men to rank first or second, and only 14 per cent of them were so ranked; while out of a possible 24 per cent of the women, 16 per cent ranked in the first two classes. The Pearson coefficient, however, shows no relation between sex and teaching efficiency in this body of high-school teachers.

The Pearson coefficient between General Merit and Experience was 0.43 with a P.E. of 0.053. No teacher ranked first or second who had less than 3 years of experience. When the years of experience are grouped by fives and the distribution made we have Table VI.

TABLE VI

YEARS	No.	GOOD		MEDIUM		POOR	
		No.	Percentage	No.	Percentage	No.	Percentage
1-5.....	160	15	9.3	109	68.1	36	22.6
6-10.....	138	25	18.1	96	69.5	17	12.4
11-15.....	65	15	23.0	42	64.6	8	12.4
16-20.....	29	6	20.6	19	65.5	4	13.9
21-46.....	28	6	21.4	20	71.4	2	7.2

It is to be noticed that there is a decided falling off in numbers between the second and third groups. Seventy per cent of all are in the first two groups. The increase in efficiency is very great from 1 to 10 years, a little less decided from 10 to 15, and efficiency as indicated by the percentage of good teachers falls off slightly from 15 to 46, but the medium group increases in that time.

The relation of the specific qualities of merit to General Merit is shown in Table VII.

The quality which ranks far above all others is Instructional Skill with its correlation of 0.90. Next in order come Results and Stimulation of Individuals with their coefficients of 0.85 and 0.80, respectively. These three, with Intellectual Capacity 0.71 and Discipline 0.67, seem to be the single qualities deemed most important by supervisors, and are the qualities, perhaps, which are most likely to be determining factors in a high-school teacher's success; all the other qualities, except

TABLE VII

	Rank	r	P.E.	No.
General Merit and Physical—				
1. General appearance.....	21	0.36	0.059	343
2. Health.....	22	.18	.062	311
3. Voice.....	16	.50	.059	343
4. Energy and endurance.....	15	.51	.059	343
Moral—				
1. Self-control.....	13	.52	.06	326
2. Sympathy—tact .....	17	.45	.059	343
3. Adaptability.....	11	.59	.06	330
4. Sense of humor.....	19	.44	.059	343
5. Fair-mindedness.....	18	.45	.062	310
Administrative—				
1. Initiative.....	9	.62	.06	330
2. Executive capacity.....	10	.62	.06	330
3. Co-operation.....	6	.66	.061	320
Dynamic—				
1. Intellectual capacity.....	4	.71	.06	328
2. Instructional skill.....	1	.90	.059	343
3. Governmental skill (discipline).....	5	.67	.059	343
4. Studiousness.....	7	.65	.06	328
Achievement—				
1. Success of pupils (results).....	2	.85	.059	343
2. Stimulation of individuals.....	3	.80	.06	325
3. Stimulation of community.....	14	.52	.066	276
Social Spirit—				
1. Interest in life of school.....	8	.64	.062	310
2. Interest in life of community.....	12	.57	.064	289
Experience.....	20	0.43	0.053	421

General Appearance and Health, show high correlation with Teaching Efficiency. As a group the physical qualities rank lowest and the dynamic and achievement qualities highest. Superintendents are evidently looking for results. It will be noted that Experience ranks third from the last, which may indicate that Experience is not always so important as is maintained. The correlation of the moral qualities and the physical qualities of Voice and Energy are high, but when compared

with the other qualities they seem to be less important. The low correlation of Health indicates either that good teaching is very hard on those engaged in it or that teaching does not attract a very strong class of people into its ranks—or that the disadvantage of relatively poor health may be overcome by exertion.

When we compare these results with those from Ruediger and Strayer's investigation of elementary teachers we find points which tend to confirm the results of both, and yet, if the findings in the two cases can be taken as typical of elementary and secondary teachers, there are differences which show some different conditions in the two.

All of our coefficients of correlation in the present study are higher than the corresponding coefficients of the earlier study. Thus our highest correlation is 0.90, theirs, 0.56; our lowest is 0.18, and their lowest, 0.04. This difference may be due to method of correlation, or to actual difference between the relation of these qualities to Merit in high-school and elementary teachers, though such a great difference is unlikely.

The quality which had highest correlation with teaching efficiency in elementary teachers was Discipline, with Instructional Skill and Initiative ranking second and third. The coefficients of Instructional Skill and Discipline were respectively 0.56 and 0.54 in their study, and 0.90 and 0.67 in the present investigation, showing the much greater relative importance of Discipline in the grades. Health and Appearance ranked lowest with elementary teachers, as they did with high-school teachers.

In the matter of Experience there are some differences, but the results tend to the same conclusion, namely, that Experience is an important factor in modifying teaching ability. No elementary teacher ranked first or second with less than 5 years of experience. Among high-school teachers 3 years was the minimum for good teachers. The average experience of elementary teachers for the first and second classes was 13 years, and for the last two classes 8.5 years. The average experience of high-school teachers for these corresponding groups was 11.8 years, and 6.39 years, respectively. The averages for the totals were 10 years for grade teachers and 8.96 years for those in high school. All of which would seem to show that elementary teachers remain in the profession longer than high-school teachers. This is shown also by the fact that of the elementary teachers 25 per cent had taught less than 5 years, and



26 per cent more than 14 years, while of the high-school teachers 39 per cent had taught 5 years or less, and only 13.9 per cent more than 15 years.

Little direct comparison can be made as to preparation. It is noticed, however, that college graduates are predominantly the best high-school teachers, but are not particularly successful in the grades.

#### STUDIES OF CAUSES OF FAILURE IN TEACHERS

The problem of relative value of qualities of merit may be approached negatively, that is by a study of teachers' failures. When teachers fail it is likely to be at those points where pressure is greatest. The teacher is weak where she should be strong. Consequently a list of qualities of merit would have a corresponding list of qualities of demerit. A study of failures may be as illuminating as a study of virtues.

We have at hand reports of two such studies—one, of the failures of elementary teachers and the other a like study of high-school teachers. Miss Moses<sup>1</sup> in 1912 obtained from 76 school systems the causes of failure among high-school teachers during the preceding academic year. The classification of causes, together with the frequency of each, appears in Table VIII.

TABLE VIII

Rank	Causes of Failure	Number of Failures	Percentage of Total
1.....	Poor instruction.....	43	20.97
2.....	Weakness of personality.....	35	17.07
3.....	Lack of interest in work.....	30	14.53
4.....	Weakness in discipline.....	26	12.68
5.....	Lack of sympathy.....	20	9.75
6.....	Inability to co-operate.....	14	6.82
7.....	{ Unprofessional attitude.....	12	5.85
	{ Weakness in knowledge of subject-matter...	12	5.85
8.....	Disloyalty.....	7	3.41
9.....	Immorality.....	4	1.95
10.....	Poor health.....	2	0.97
	Total.....	205	99.85

The qualities lacking in these teachers who failed cannot be compared throughout with the qualities found to be most important by our

<sup>1</sup> *School and Home Education*, January, 1914.



own study of high-school teachers, but where comparison is possible, the order is found to be practically the same.

In a similar manner a study of the causes of failure of elementary teachers by Mr. Sherman Littler<sup>1</sup> parallels the Ruediger and Strayer results reported above. Mr. Littler makes the following partial comparison of the results in the two studies:

Qualities of Merit  
(According to Ruediger and Strayer)

1. Discipline
2. Teaching Skill
3. Initiative
4. Personality
5. Studiousness
6. Follow Suggestions
- Last—Health

Reasons for Failure

1. Poor Discipline
2. Weak Personality
3. Lack of Teaching Skill
4. Lack of Interest
6. Lazy—No Daily Preparation
7. Failure to Co-operate
14. Health

In each study, health seemed to have little weight in determining the success or failure of elementary-school teachers.

Investigations tending to establish in an accurate way the qualities into which teaching efficiency is to be analyzed and the actual relation which each of these qualities bears to teaching merit have been all too few and too limited in scope to be conclusive. The problem is very large and the difficulties in the way of getting exact data are many.

It is easier to point out the needs in this field of investigation than it is to meet them. Some of the fundamental needs for the final solution of the problem are the following:

1. A list of terms in which the various aspects of teaching efficiency shall be expressed, terms which are specific in their meaning and which shall be generally recognized as the categories in which teaching efficiency is best described.

2. These terms must be made exact by careful definition and standardization, so that all who use them intelligently will mean the same thing by them.

3. There must be generous co-operation on the part of a large number of school men who are sufficiently trained to know what teaching must

<sup>1</sup> "Causes of Failure among Elementary School Teachers," *School and Home Education*, March, 1914.

be to conform to the best educational principles and who are able to give exact data.

4. We must have command of situations in which two or more officials may test, on the same body of teachers, whatever method is proposed.

Only under conditions such as these will teaching efficiency be resolved into its elements, the relative value of the various factors be determined, and the problem of measuring the presence or absence of qualities of merit be solved.

## CHAPTER III

### A METHOD FOR GUIDING AND CONTROLLING THE RATING OF TEACHERS

Objective measurement of educational products and processes has not yet reached the point where we can rely upon such measurements to give us all or even most of the information we need about our teachers. We are still dependent, to a very great extent, on the judgment of supervisors and others whose business it is to have this information. This does not mean that we are to be without exactness in our judgment of teaching efficiency, or that we have to belong to the ranks of those who judge by "general impression." Although the exactness cannot be so great as that of objective measurement, the latter will have its place and there will be, further, the accuracy which comes from thorough analysis, careful observation, exact definition of terms, complete record, and controlled conditions at all possible points. The object of any scheme set up for "measuring" teaching efficiency should be to remove the final result as far as possible from arbitrary personal opinion by controlling the method by which the result is obtained.

A large task confronting us in our study of the problem has been the development of some scheme for getting the necessary information in regard to the general efficiency of teachers and the presence or absence of certain supposed qualities in the same teachers; in other words, the development of a rating scheme which should avoid as far as possible the difficulties enumerated in our discussion of rating schemes.

The main considerations in the construction of a rating scheme are (1) selection of factors on which a teacher is best judged, (2) careful definition of terms, and (3) the best method of scoring the judgments.

*Choice of terms for judging teaching efficiency.*—In choosing the qualities of merit which should form the basis of our analysis of the teacher's efficiency, the following points were held in mind:

1. The topics must not be too few, for either they will be so general that little analysis is made, or, if not general, they will be sure to leave out important points.

2. On the other hand, the list must not be so long as to be cumbersome and a great burden to those who are called on to rate teachers.

3. The qualities must be of the greatest possible suggestiveness, both to supervisors and to teachers. The scheme must direct the attention of the supervisor to the really vital factors of the situation so that he cannot be deceived by any display of nonessentials. The attention of the supervisor should be directed also to the pupils and not alone to the teacher.

4. The terms should set up for the teacher a standard by which to measure her own work, and give her ideas for self-improvement. By helping her to be properly self-critical, they should prepare the way for supervisory criticism and make her willing to receive helpful suggestions. The list should help the teacher also by giving her definite ideas as to what is expected of her by the supervisory staff.

The list of qualities chosen for this study and displayed in the score card reproduced herewith (see Fig. 1, p. 44) does not pretend to be a perfect list, either in statement or in completeness; it has no doubt left out factors which others would include and included some which others would leave out. It has been reduced somewhat arbitrarily from a much longer list gathered from many sources. It has avoided as far as possible vague, general, and all-inclusive terms, such as "personality" and "scholarship." The terms are as specific and exclusive as they could be made. They are not more numerous than seemed to be necessary to include points on all aspects of the teacher's life and work.

The items have been organized under five heads which tend to make the terms more meaningful. The first group, "Personal Equipment," includes certain of the teacher's physical, mental, and moral qualities, personal qualities which might be factors of success in many callings but which are here to be considered in their relation to school activities. Group II, "Social and Professional Equipment," is meant to cover qualities particularly important in the social situation involved in the school, both as related to the children and community and as related to the profession. "School Management" has to do with the mechanical and routine factors of the teacher's schoolroom work, as indicated by her care of the room, handling of classes, and the like. The fact that *Discipline* is placed under this head does not mean that discipline is considered to be a purely mechanical process. A place might have been made for it in Group IV and Group V but it seemed to belong most logically to the management phase of the teacher's work.





## EXPLANATION OF TERMS USED IN SCORE CARD SHOWN ON OPPOSITE PAGE

- I. *Personal Equipment* includes physical, mental, and moral qualities.
  1. *General appearance*—physique, carriage, dress, and personal neatness.
  3. *Voice*—pitch, quality, clearness of schoolroom voice.
  4. *Intellectual capacity*—native mental ability.
  5. *Initiative and self-reliance*—independence in originating and carrying out ideas.
  7. *Accuracy*—in statements, records, reports, and school work.
  10. *Integrity and sincerity*—soundness of moral principles and genuineness of character.
  13. *Tact*—adroitness, address, quick appreciation of the proper thing to do or say.
  14. *Sense of justice*—fairmindedness, ability to give all a "square deal."
- II. *Social and Professional Equipment* includes qualities making the teacher better able to deal with social situations and particularly the school situation.
  15. *Academic preparation*—school work other than professional. Adequacy for present work.
  16. *Professional preparation*—specific training for teaching. Adequacy for present work.
  17. *Grasp of subject-matter*—command of the information to be taught or the skill to be developed.
  18. *Understanding of children*—insight into child nature; sympathetic, scientific, and practical.
  22. *Interest in lives of pupils*—desire to know and help pupils personally, outside of school subjects.
  23. *Co-operation and loyalty*—attitude toward colleagues and superior officers.
  24. *Professional interest and growth*—effort to keep up to date and improve.
  26. *Use of English*—vocabulary, grammar, ease of expression.
- III. *School Management* includes mechanical and routine factors.
  29. *Care of routine*—saving time and energy by reducing frequently recurring details to mechanical organization.
  30. *Discipline (governing skill)*—character of order maintained and skill shown in maintaining it.
- IV. *Technique of Teaching* includes skill in actual teaching and in the conduct of the recitation.
  31. *Definiteness and clearness of aim*—of each lesson and of the work as a whole.
  32. *Skill in habit formation*—skill in establishing specific, automatic responses quickly and permanently; drill.
  33. *Skill in stimulating thought*—giving opportunity for and direction in reflective thinking.
  34. *Skill in teaching how to study*—establishing economical and efficient habits of study.
  35. *Skill in questioning*—character and distribution of questions; replies elicited.
  36. *Choice of subject-matter*—skill with which the teacher selects the material of instruction to suit the interests, abilities, and needs of the class.
  37. *Organization of subject-matter*—the lesson plan and the system in which the subject-matter is presented.
  39. *Skill in motivating work*—arousing interest and giving pupils proper incentives for work.
  40. *Attention to individual needs*—teacher's care for individual differences, peculiarities, and difficulties.
- V. *Results* include evidence of the success of the above conditions and skill.
  41. *Attention and response of the class*—extent to which all of the class are interested in the essential part of the lesson and respond to the demands made on them.
  42. *Growth of pupils in subject-matter*—shown by pupils' ability to do work of advanced class and to meet more successfully whatever tests are made of their school work.
  43. *General development of pupils*—increase in pupils' ability and power along lines other than those of subject-matter.
  44. *Stimulation of community*—effect on life of the community tending to improve or stimulate its various activities.
  45. *Moral influence*—extent to which the teacher raises the moral tone of the pupils or of the school.

"Technique of Teaching" is a group of factors ordinarily lumped together in the term "instructional skill." A consideration of principles of method reveals the fact that instructional skill is not a simple thing but is an inclusive name for many kinds of skill. A teacher may be strong in some kinds of teaching and weak in others. Moreover, this is the point where teachers are likely to be helped most by an analysis of their activities. Our analysis attempts to bring out some of these phases of teaching technique.

The first four groups of qualities consider the native ability, preparation, social qualities, and technical skill which the teacher puts into the work. The fifth, "Results," considers the effect of these things on the lives and development of the pupils. Some of the items here are more general than we should like. If a teacher is teaching several subjects it is likely that the pupils are making more progress in some subjects than in others. A superintendent wanting to get at the facts more accurately might break up the topic "Growth of pupils in subject-matter" into growth in specific kinds of subject-matter. "General development of pupils" expresses inadequately an important item in the teacher's results. Besides growing in knowledge of subject-matter and in skill in school arts, pupils are changing for better or worse in many other ways, such as ability to work independently, ability to deal with social situations, ability to study, personal habits, and the like. All of these are combined loosely in our term "General development of pupils."

*Definition of terms.*—It is of the greatest importance that the terms used be understood by all who use them. The rating is practically useless if the one rated, the one reporting, and the one afterward using the report have different things in mind as the meaning of the various qualities. Moreover, one to whom a term suggested much would be more critical of the teacher's standing in that respect than one to whom it suggested little. In order that all might, as far as possible, have the same full meaning, a page of "Explanation of Terms" has been placed opposite the "Efficiency Record," for easy reference. Those terms which did not seem to carry their own meaning completely have been defined or elaborated here. These explanations have been made as brief as is consistent with clearness, in order that reference from equality to explanation might be as easy as possible. Not all the terms have been defined, for in some cases the terms appear to carry their own meaning with sufficient completeness. It would be possible, and per-

haps desirable, to have a greater amount of suggestive material under this head.

*Recording the judgment.*—The method of recording the rating officer's judgment will have much to do with the effectiveness of the scheme. The mere clerical labor of making a large number of reports is enormous and should be reduced to a minimum. The scheme should make the recording of the judgment as easy as possible by eliminating all unnecessary details of writing and expression.

The record should be of such a character that degrees of excellence can be easily expressed. This should be so clear that comparisons of different qualities in the same teacher and of the same quality in different teachers can be made without difficulty.

The terms in which the degrees of excellence are expressed should be reducible to a single term to indicate a "success grade" for the teacher, if desired.

The record should permit quick and easy analysis so that the teacher's weak and strong points would appear at once.

For these reasons, the method of recording the judgment should be as objective and "visible" as possible. The judgment must be made to stand out clear-cut, comparable, and as meaningful as may be.

We have seen in an earlier part of our study the difficulties involved in the methods of record commonly used. These methods do not seem at all capable of meeting the demands we have just set down.

The form of expression which is most likely to suit our needs and express adequately such a complex fact as a teacher's efficiency is that of graphical representation. It is possible to express easily, by means of a curve, many things that could be expressed in words with the greatest difficulty. The value of the graphical method will be apparent as we proceed.

*A graphical method of recording judgments.*—As will be seen from the score card reproduced on p. 44, there is opposite each quality a scale on which the degree of excellence is expressed by the distance measured along the line from the base.

In order to facilitate the placing of a teacher along this line and—what is equally important—to control the placement to some extent, it seemed wise to make a fivefold division of our scale. These five divisions are called, beginning at the left, Very Poor, Poor, Medium, Good, and Excellent. Contrary to the practice of most rating schemes which rate

teachers on a fourfold scale, we used five divisions in order that there might be a Medium and the possibility of differentiation into those Good and Excellent in the group above medium, and into Poor and Very Poor in the group below medium. It should be easy to place a teacher in one of these five classes with respect to any quality, whereas the placement in a scale of many divisions, without such control, might be confusing and uncertain.

The size of the divisions is suggested by the curve of probability. If we had a very large number of teachers classified with respect to any one quality, we should expect to find the largest number medium, not so many good or poor, and still fewer excellent or very poor. The exact number falling in each division would depend on our arrangement of the limits. Various investigators have proposed different percentages for these divisions. We give here the number out of 100 recommended by Professors Meyer,<sup>1</sup> Dearborn,<sup>2</sup> and Cattell,<sup>3</sup> as proper for each division of Very Poor, Poor, Medium, Good, Excellent.

	Very Poor	Poor	Medium	Good	Excellent
Meyer.....	3	22	50	22	3
Dearborn.....	2	23	50	23	2
Cattell.....	10	20	40	20	10

We have chosen the more liberal and more easily applied division of Cattell for our division of the scale. We have divided the line into ten equal spaces arranged in five groups of 1, 2, 4, 2, and 1 spaces each.

A supervisor's first judgment, then, with respect to a teacher's standing in any of the qualities indicated, must be to determine the class in which she should be rated for that quality.

Within the class there is further opportunity for differentiation. Thus, if a teacher is Good in any quality but nearly Excellent, the mark for that quality will go in the space near the Excellent division; if the teacher is barely Good in the quality considered, the mark will be placed in the space next to Medium.

<sup>1</sup> M. Meyer, "The Grading of Students," *Science*, N.S., XXVIII, 243.

<sup>2</sup> W. F. Dearborn, "School and University Grades," *Bull. of Univ. of Wis. No. 36*, 1910.

<sup>3</sup> J. McK. Cattell, "Examinations, Grades and Credits," *Pop. Sci. Mo.*, LXVI, 367.



The instructions accompanying each efficiency record are as follows:

## INSTRUCTIONS

1. Before filling out the record, read the "Explanation of Terms" on p. 3.
2. Opposite General Rating and opposite each quality of merit is a scale on which may be indicated all shades of judgment from Very Poor to Excellent. Place a small cross (X) in that space which indicates your judgment in each case.

## EXAMPLE

Qualities of Merit	V.P.	Poor	Medium				Good		Ex.
General appearance...						X			
Health.....		X							
Voice.....				X					

The crosses indicate that in general appearance the teacher is judged to be Medium but nearly Good; in health Poor bordering on Very Poor; in voice Medium.

3. *General Rating* is your estimate of the general merit of the teacher based on your knowledge of her work. It is to be recorded *after* making the detailed rating. Very Poor general rating means that the teacher is practically a failure and not worthy of retention. Poor general rating means that the teacher is unsatisfactory and below the average for that place but still usable. Medium means average merit for the position held. Good means above the average. Excellent means very superior.

4. *Detailed Rating*: Each quality is to be judged on its own basis without reference to other qualities. Your mark will express your judgment as to the degree of presence or absence of merit in the teacher with reference to the quality in question. A mark of Very Poor in any quality means extreme lack of merit as far as that quality is concerned. Poor means unsatisfactory and below the average. Medium means satisfactory or average merit in the quality. Good is above the average. Excellent is very superior.

5. Each judgment should be the result of careful thought based on actual observations. If doubt is felt as to the correctness of any judgment, record it with a question mark (?) instead of with the cross (X). If you can express no opinion as to any quality, make a note of the reason. This is important.

6. Note the questions on p. 4.

The questions referred to were designed to bring out the effect of the blank on the judgment of the one using it, and also any criticisms that he might have in mind.



*Application of the blank to an individual case.*—How the scheme just described operates is best shown by referring to an actual record such as that reproduced on p. 44, Fig. 1. This report displays the superintendent's analysis of this teacher and shows very clearly the components of her efficiency, in his estimation. Miss E's General Rating is given as Poor and an examination of her Detailed Rating confirms this judgment. In most particulars she is quite satisfactory and even above the average. Her academic preparation is very good but her professional training is limited and not adapted to the third grade. She is still inexperienced and has therefore not had her understanding of children and her technique developed. This fact and her lack of routine probably account for her very poor discipline and inattentive class. We must be careful not to infer too much, but these relations seem clear. On the basis of the personal, social, and professional equipment alone, it would be possible to write for this teacher an excellent recommendation, but when all the facts are scrutinized, one's opinion of her teaching efficiency is very much lowered. She must be set down as a poor teacher but one who has possibilities of being a good teacher.

*Reduction of the rating to a single term.*—The General Rating is the rating officer's own judgment of the teacher's general merit recorded *after* filling out the Detailed Rating. It is not determined mathematically but is the officer's mental summation of the qualities on which he has just passed judgment. As the record stands, it indicates nothing as to the relative value of the various qualities. It simply allows for judgment on each quality and indicates general merit by the location of the resulting "curve." We may resort to other means, however, to get the general result.

The Median: Taking our individual case again (Fig. 1), it will be noticed that 3 qualities fall in column 1, 5 in column 2, 7 in column 3, and so on until the 45 qualities are placed. The Median or middle point of this distribution falls in column 5 and is 5.03, 30 per cent higher up the scale than the superintendent's judgment.

The Average: If we multiply the number of each column by the number of qualities falling in it and divide the sum of these products by 45, we have the average of the distribution. In this case it turns out to be 5.02.

It will be seen at once that these two methods of determining the general merit grade are based on the assumption that all the qualities

are of equal value, which, of course, they are not. It is obvious that some of these qualities should have more consideration than others in determining the teacher's general merit.

These methods are most liable to error when the qualities are scattered as in the case of our illustration. In such a case some points are rated so low that the teacher is obviously poor, yet so many qualities are rated high that the Average and Median of their distribution are raised to a point which would make the teacher seem to be quite satisfactory. There would be little or no error if the qualities all fell into one column or were distributed to only two or three columns close together; that is, supposing our list of qualities is itself satisfactory as a basis for judging teaching efficiency.

It is necessary that the qualities be weighted in proportion to their importance if a mathematically determined success grade is to be true. The relative importance of the qualities of merit here considered is a point on which we hope to have some light as a result of the information gathered by this method of rating.

Before taking up this important point, let us see what the nature of our information is, how reliable it is, and how well our proposed method really guides and controls the rating of teachers.

## CHAPTER IV

### TESTS OF THE PROPOSED METHOD

Any conclusions to which we may come later in regard to the relative importance of the various qualities of merit and in regard to other problems involved are based on the experience and work of between 40 and 50 school men and women who have tried out and criticized for us the scheme just described. In the correlations to be discussed later, ratings of 424 teachers from 39 schools were used. These 39 schools were representative of 27 cities, all but 8 of which are in Illinois. They represent populations varying in size from less than four thousand to two million. The smallest number of ratings used coming from one source was 5, the largest number was 25. Most of the officials co-operating with us contributed about 10 ratings each. Their work was quite voluntary and very generously given because of their interest in the problem. The only cases in which the ratings may not have been voluntary were those of principals in one city who were asked by their superintendent to rate their teachers for us. Twenty of the rating officers were superintendents and 19 of them principals. Ten of the latter were women.

*Ratings of whole schools by single judges.*—Typical results obtained when a body of teachers is rated by one officer are shown in Figs. 2 and 3. Each figure displays the ratings of the Best teacher in the given group, the Poorest of the group, and the Median made up of the middle points of the whole number of ratings for each quality. Thus in Fig. 2 the best teacher, Miss S., is marked Poor in General Appearance, while the poorest, Miss M., is rated a low Medium. The Median of the 19 teachers with respect to General Appearance is Good, which means that there are at least as many teachers rated Good or Excellent in General Appearance as there are teachers rated below. The teacher called Best is called so because she received the highest General Rating, or, if more than one received the same high General Rating, because she had the highest Median Rating (see chap. iii). Similarly, the one called Poorest was rated lowest. The Best and the Poorest in each case are the upper and lower limits as far as general merit is concerned but their ratings in detail are not always the extremes. Thus in Fig. 2 both are below

Median in General Appearance (quality 1), both are above Median in Professional Interest and Growth (24), and Best ranks below Poorest in Professional Preparation (16). The Median curve represents the central tendency of the group as a whole.

Both of these sets of curves show clearly that, as we naturally expect, Good and Poor teachers are more distinguishable in some qualities than in others. In some cases the Good and Poor curves are quite divergent from each other and from the Median. In others there is much confusion. Fig. 2 shows more clearly than does Fig. 3 the fact that the Good and Poor curves diverge more in those qualities from Discipline down than in the personal and social qualities in the upper part of the schedule. This is quite generally the case. The qualities in these upper sections which usually show divergence are Initiative (5), Adaptability (6), Grasp of Subject-Matter (17), and Understanding of Children (18).

There is shown a tendency toward greater liberality of judgment in the first two groups of qualities than in the last two. The Median or group curves tend to the right in the upper part of the score card. This is especially noticeable in young teachers, as in the case of our example in Fig. 1 (chap. iii). Young teachers may be quite well equipped personally and socially, but only experience, practice, and training can develop their understanding of children and their technical skill. It is also possible for older teachers to be held in high esteem for their personal qualities and yet be marked low for other and more technical reasons.

*Ratings by judges at different times.*—It is important to know whether these results are accidental or whether a rating officer would get the same record a second time, without referring to the first result. A number of our correspondents have been willing to rate their teachers for us a second time and the results in two cases are given in Fig. 4. Principals of Schools IVc and IVe rated their teachers in May and again in the following December. The curves in Fig. 4 are, as indicated, the records of the Best and Poorest teachers in these two schools at these two times. The principals did not have the first records at hand for reference.

In School IVe the two ratings of the Best teacher are identical with the exception of one item, Health, which is lowered one point. The second rating of the Poorest teacher follows the first very closely in spite of its scattered character. The December rating raises the detailed rating in 26 points, is identical with that of May in 11 points, and lowers



Efficiency Record

Teacher Best-Miss S. ; Best-Miss M. City XXV Grade taught B. 4th ; P. 1st  
(indicate sex) (or building) (or subject)  
Experience B-10yr ; P-6 years. Salary B-70 ; P-57.50 per month.  
Highest academic training B- High School ; P- High School  
Extent of professional training B- 2 Summer Terms ; P- Normal Graduate.

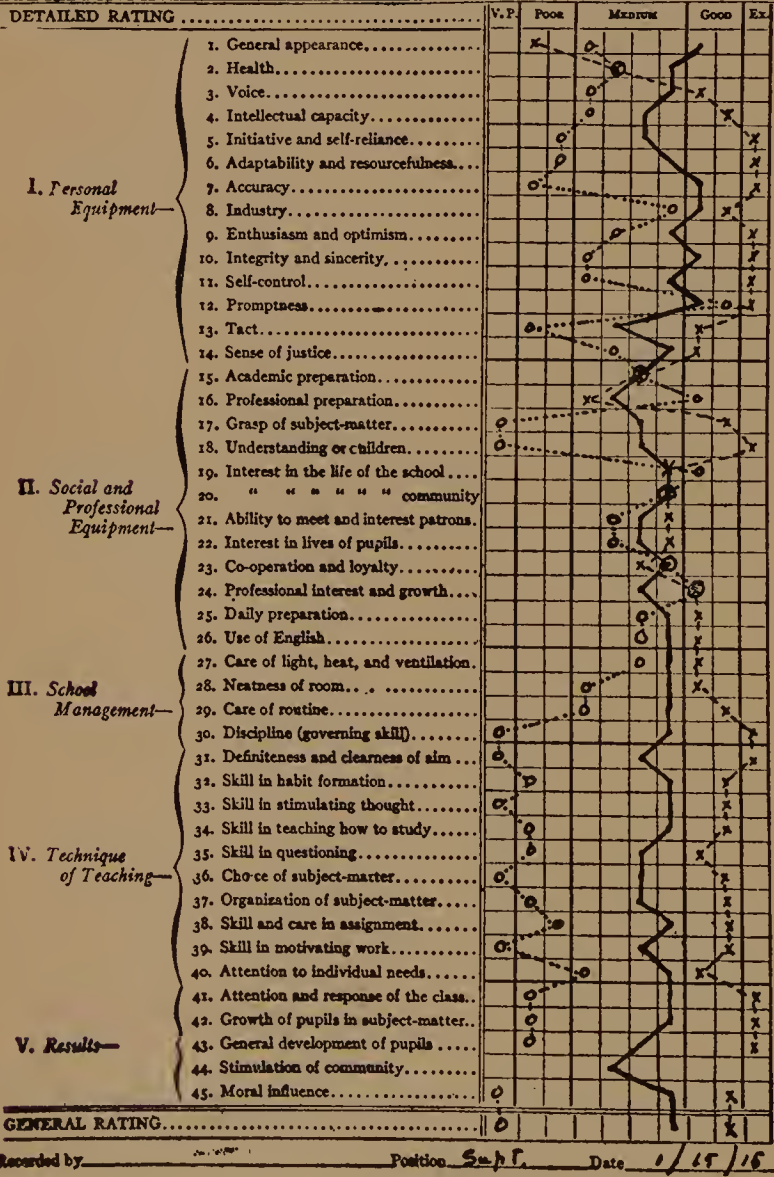


FIG. 2.—Summary of records from School XXV



## Efficiency Record

Teacher Best. Miss J. Pares-T. Miss C. City XXVI Grade taught B-7+8 ; P-  
 (indicate sex) (or building) (or subject)  
 Experience B-3 ; P-12 years. Salary B-65 ; P-75 per month.  
 Highest academic training B- High School + College ; P- High School.  
 Extent of professional training B- ; P- Summer courses.

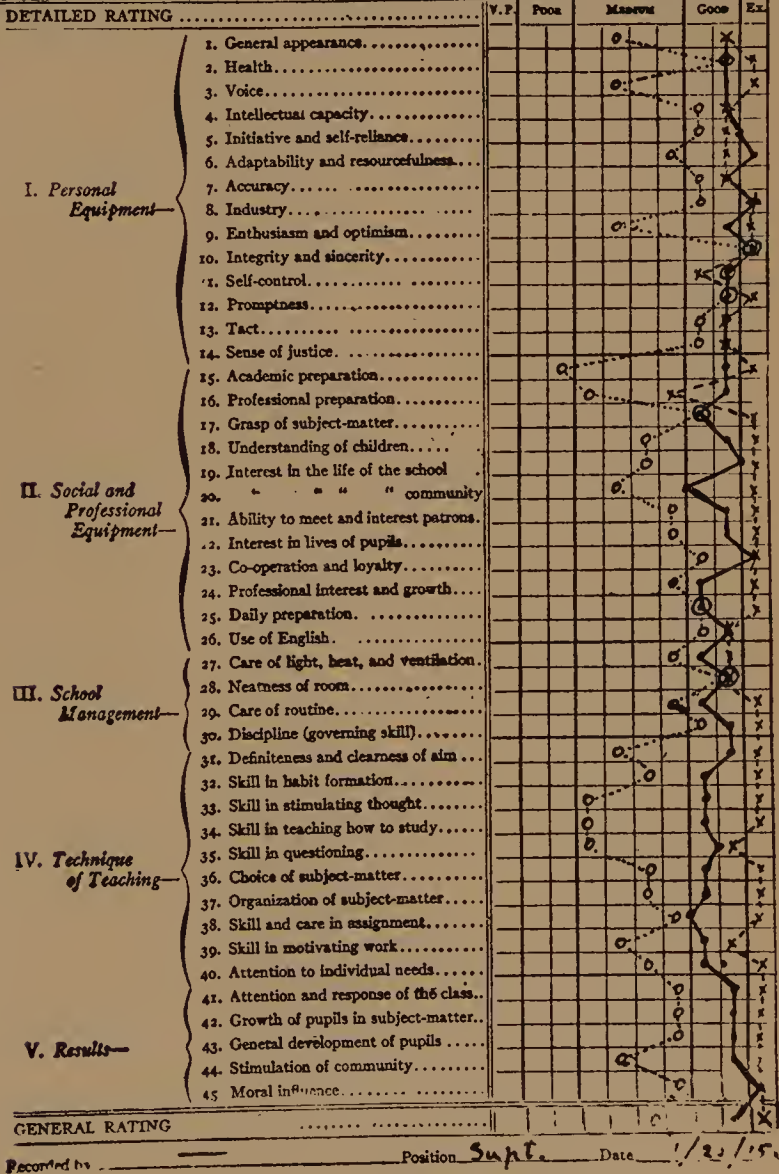


FIG. 3.—Summary of records from School XXVI

it in 8. Notwithstanding the general upward tendency of the second record, the second General Rating is one point lower than the first. This is probably due to the fact that the first General Rating is too high to be consistent with the details. The changes downward, in items 4, 15, and 16, are obviously due to change in the principal's judgment, as these qualities could not have changed as they are recorded to have changed.

The records from School IVc show considerable downward revision in the case of the Best teacher and upward revision in the case of the Poorest. There is no change in the General Ratings. Here, as in School IVe, we find a downward change of the estimate on Academic and Professional Preparation, a change which could not be made. Discrepancies like this, and other changes which are not due to actual differences in the teacher judged, can no doubt be very largely overcome by practice and by greater clearness in the mind of the judge as to what he means by the various grades of excellence in these particulars.

*Ratings of teachers by two or more judges.*—The most important test of any rating device is its ability to bring the same result when a teacher is rated by two or more judges. It is very improbable that two judges of a teacher would see and record merit or lack of it in exactly the same way. Variation is to be expected in this as in the use of every other measuring device, but we should know how much variation to expect and how much it may be reduced by practice. To obtain control of situations giving us ratings of a teacher by more than one judge has been nearly impossible. Our scheme has therefore not been tested as severely in this way as is desirable.

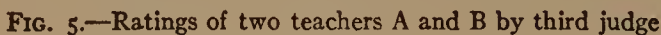
This phase of our problem can best be solved by city superintendents with corps of supervisors and long periods of time at their command.

The superintendent of School XL secured for us the co-operation of some of his supervisors in rating a number of his teachers. The records of two of these teachers as given by three judges each are shown in the accompanying Fig. 5. Teacher A was rated by the superintendent, the supervisor of elementary grades, and a general supply teacher. Teacher B was rated by the superintendent, the supervisor, and her principal.

An examination of Fig. 5 will show very great agreement among the three judges in these cases. At one point (28) in A, there is a divergence of four spaces, but very few differences are more than two spaces. In the cases of two other teachers not shown here, the supervisor gave ratings of Good, while a general supply teacher in one case



Superintendent.....  
Supervisor.....  
Third Judge-----





and a principal in the other gave ratings of Medium, a difference of three spaces in General Rating, and larger differences in many details. Through another means we were able to obtain incomplete ratings of a teacher from officers in three different towns where she had taught. These ratings are liable to error owing to lapse of time, but, notwithstanding that, they agree within one space as to General Rating, placing her at high Medium or Good, and within five spaces in detail. Judgments are likely to differ from one class of excellence to another adjoining, such as from Medium to Good or Medium to Poor, or from Good to Excellent, but seldom from Good to Poor or farther.

*Differing standards of excellence.*—One of the largest complicating factors preventing exact and comparable results is the difference of standards of excellence in the minds of the judges. A teacher who ranks Excellent in one officer's mind is found to rank only Good or perhaps Medium in the rating of another judge who is more critical and less easily satisfied. We find numerous examples of this difference in standards in the ratings at hand. In Fig. 5, just reviewed, the superintendent is more critical of A and B than are the other two rating officers. In Fig. 6 we have the same thing shown in a larger way. Fig. 6 compares the best, poorest, and median (or group) records from two schools in the same city. It is not likely that in this city of 24,000 there is any great difference in the ability of the teaching body from school to school. We are assured by the superintendent that there is no reason to think that the teaching force of one school is much better or worse than that of another. Any striking differences found are in all probability due to difference in standards of excellence held by the principals. The principal of School XXIa rates her eight teachers high, one being Excellent, six Good, and one a high Medium. As a group her teachers are very good. The principal of School XXIc has rated his thirteen teachers much lower, one being Excellent, one Good, ten Medium, and one Poor. The group curve falls in the Medium column 40 to 50 per cent lower than Principal XXIa. It is obvious that Principal XXIc is much more critical than Principal XXIa. The reason for this is perhaps explained by the training and experience they bring to this work of judging teachers. Principal XXIc is a man with six years of experience besides being a normal graduate and having a year of university study along professional lines. Principal XXIa is a woman with an experience of twenty-nine years and little or no professional training.





*Differing abilities to discriminate.*—These curves of Fig. 6 illustrate equally well another difficulty in the way of obtaining comparable data, namely, the unequal abilities of school officers to discriminate between teachers as to their merit in the various items of our schedule. If the ratings for School XXIa are true in all respects, that body of teachers is remarkably good and remarkably uniform. It is probable, however, that the records of School XXIc are nearer the truth.

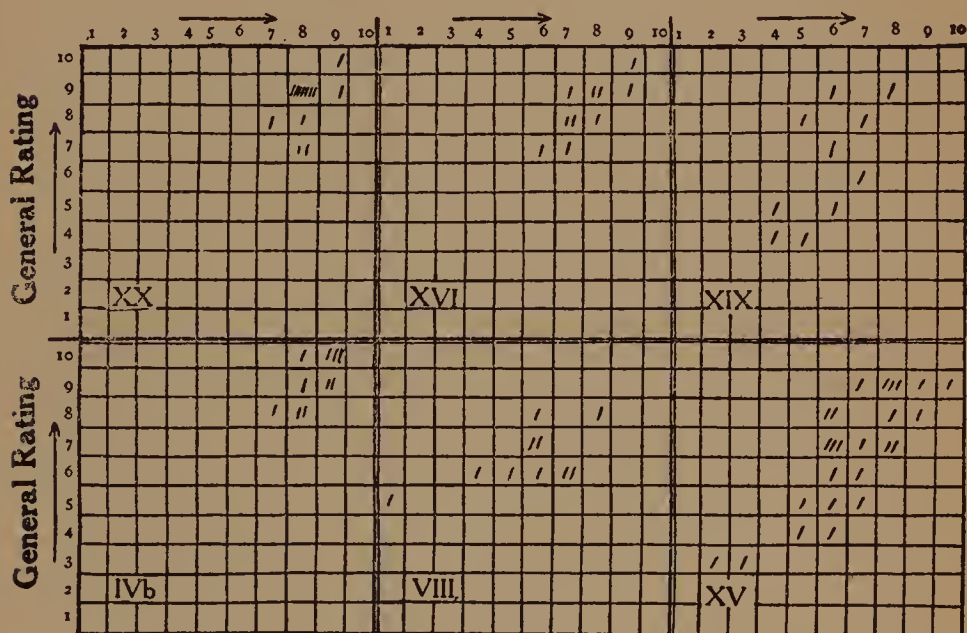


TABLE IX.—Combined General Ratings and ratings in Skill in Questioning showing differing amounts of discrimination in six schools. (General Ratings run from bottom to top in each square. Ratings in the quality run from left to right.)

Difference in discrimination is shown not only in regard to general merit but in regard to each quality. As we shall point out later, more discrimination is to be expected in some qualities than in others, but in any one quality there is wide variation in ability to see differences.

This is shown graphically in Table IX, where the ratings for Skill in Questioning and the General Ratings are combined in the cases of six different schools. In School IVb, the ten teachers are Good in Skill in Questioning. The thirteen teachers of School XX range from Excellent to Medium in general merit, but are confined to Good except in one

case. School XV shows wide variation both in general and in the particular quality. The superintendent in School VIII gives his teachers General Ratings of Good or Medium but ratings in Questioning Ability ranging from Good to Very Poor.

The chief conclusion to be drawn from this discussion of differing standards and unequal abilities to discriminate is that, if the ratings in any city are to be uniform from school to school and used as a common basis for comparison, the officers making the ratings must be trained to a common standard of excellence and brought to a common basis of discrimination. As rating of this kind is now done it is as much an indication of the ability of the rating officer as it is a measure of the ability of the teacher. Greater mutual understanding, and more information and practice will do much to reduce the discrepancies found in these records and make them more truly measures of teaching efficiency.

*How the blank controls the rating.*—Many rating schemes have failed and have been discarded because after a few years all grades were raised to the point where no discrimination was shown. The rating scheme must control this factor and prevent the raising of the success grade from year to year unless real improvement is shown. In the scheme here proposed, the rating officer is required to pass judgment on separate items, one by one, and rate them as Very Poor, Poor, Medium, Good, or Excellent. The judge cannot very well give a high general grade for poor ability, for either he must misrepresent the teacher all along the line, or have his General Rating inconsistent with the details.

The extent to which the principals and superintendents who have tried this blank have been influenced and controlled by it in their final rating is best shown by their answers to our question: "Did filling out this record modify your previous opinion of this teacher? If so, how?"

When the officers were in the habit of rating their teachers the blank did not change their general opinion to any extent. They say, however, that filling out the record particularized their judgment. The cases in which judgments were lowered and those in which new points of excellence were found, are about equal. Some of the answers to our question are as follows:

"Careful thought necessitated, showed up faults."

"Lowered opinion."

"Made factors of judgment more definite and certain."

- "Strengthened opinion; led to closer analysis."
- "Lowered opinion three points."
- "Raised rating."
- "Made rating more definite."
- "Gained more definite detailed knowledge."
- "Made me realize her possibilities."
- "Discovered good points."
- "Points of excellence not realized before."
- "Rated him higher than before."
- "Detailed attention to III, IV, and V depreciated opinion of her."
- "Previously gave too much attention to minor points."
- "General impression was more favorable than analysis justified."

These quotations and others which we might give indicate plainly the unreliability of general impressions and unanalyzed judgments. The judgment may be raised or lowered by a closer study of the teacher, but in either case the previous judgment was not correct and would have been an injustice to teacher and school.

*Difficulties in filling out the record.*—As our blank was first constructed, it had twenty spaces in the scale instead of ten. The number was reduced because of the difficulty rating officers felt in choosing among so many. There were more choices possible than they could distinguish. Definition of Excellent, Good, Medium, Poor, and Very Poor in General Rating and Detailed Rating has also helped eliminate doubt from the minds of the judges as to where on the scale the teacher should be placed. Our definitions of these terms have, of necessity, been of a most general character. Detailed definition of what is Excellent, Good, Medium, Poor, and Very Poor, General Appearance, or Skill in Questioning, or Growth of Pupils in Subject-Matter, or other particular qualities would be very difficult and tedious in any circumstances and quite impossible within the limits of a score card.

There was difficulty in applying all the terms to all situations. For instance Stimulation of Community is hard to apply in the city where teachers may scarcely touch the community outside the school. In a small town this item would be more important.

More frequent is the difficulty of applying all items to all grades in the same school. Thus principals sometimes hesitate to grade primary teachers on Teaching How to Study and on Assignment when little or no formal study is done. Likewise teachers of manual arts have little to do with study and assignments as ordinarily understood.



A much greater source of difficulty has already been mentioned in our discussion of differing abilities of the judges to discriminate between teachers. This lack of discrimination is due in largest measure to actual ignorance on the part of the rating officer, first as to what constitutes excellence in many of the aspects of teaching, and second, as to what the teachers are actually doing. In response to our request to note any difficulties in filling out the record, *Technique of Teaching* is set down most often as the set of qualities most difficult to judge. There is little hesitancy or uncertainty in expressing opinion about the teacher's personal or social qualities.

Some of the principals excuse themselves on the ground that they do not have sufficient time for observation, and this may very well be true in the cases of those who do regular teaching work.

Objection has been raised to the large number of points to be considered. On the other hand, additional points have been urged. It is probable that the list here tested is as long as it ought to be if the convenience and limited time of judges are considered. At the same time it would be difficult to reduce the list if it is to be a basis for self-criticism on the part of the teacher and a method of helping her in detail. As was said in another connection, if the General Rating were the only purpose accomplished, a shorter list would be sufficient.

The time required to fill out each individual record is variously given as from 5 to 45 minutes. The usual amount of time required is about 15 minutes, after the information has been gathered. After a principal or supervisor has worked with a teacher for some months and has had many opportunities for observing her with regard to the points here enumerated, all of which is in his daily line of duty, it should not be at all difficult for the officer to fill out the record in 10 minutes. This does not seem to be an excessive amount of time to give to this important and delicate work.

#### SUMMARY

1. The ratings shown in this chapter, and others which we have at hand, show clearly the possibility of expressing by the graphical method all shades of excellence and all combinations of specific kinds of excellence in teachers.

2. With slight variations, principals are able to get the same result at two different times without reference to the first record made.



3. Different judges of the same teacher are able to obtain results varying from each other less than three spaces of the scale.

4. Comparability of ratings from different schools is lessened by differing standards of excellence from school to school and by differing abilities to discriminate on the part of school officers.

5. If results from different schools are to be made thoroughly comparable the judges of teachers must be trained to a common standard of excellence and be given a common fund of knowledge as to what constitutes excellence in teaching.

6. Tests show that the use of an analytical blank of this kind may raise or lower judgments previously formed. General impressions and unanalyzed judgments are not reliable.

## CHAPTER V

### RELATIVE IMPORTANCE OF QUALITIES OF MERIT

*The problem.*—The rating device which we have described in the preceding chapter was designed primarily to obtain for us information on which to base an accurate estimate of the value of the qualities of teaching merit there set forth. Our idea has been to make it as easy as possible for school officials to give us correct information. The rating officer is not worried by any schedule of values or what *he thinks* is the relative importance of the qualities under consideration. He has before him in each case an actual teacher whose various qualities he is judging in terms of Excellent, Good, Medium, Poor, and Very Poor, with variations. At the end of this series of judgments he sums up these qualities as they appeal to him in this teacher and records in like manner a grade representing her general merit. When a number of such records are combined we find that he has given us, more or less unconsciously, very good evidence as to what qualities he actually lays emphasis upon when he judges teachers. This evidence is the relation which the ratings in the various qualities bear to the ratings in general merit. The amount of emphasis which he puts on any quality will be measured by the degree of correspondence between the two series of ratings. If we put together a large number of such sets of ratings, they should tell us—in so far as they are true—the extent to which these qualities are related to general teaching merit, and this would furnish a basis by which any judge of teachers might correct the emphasis in his own judgments. The determination of the relation between the qualities of merit and general merits and the relative emphasis to be placed on the various factors is the problem immediately before us.

In determining the correlations given below, the ratings of 424 teachers from 39 schools have been combined. As we saw in one study of these ratings in the last chapter, they represent wide variations of ability both on the part of the judges and on the part of the teachers. They come from schools in towns and cities of various sizes and of different character of population. Our instructions to those rating teachers for us were that if all the teachers were not rated, those selected for rating should represent as wide a range of teaching efficiency as the officer

had in his school. There is, therefore, nothing about the method of selection making it improbable that our sampling of the elementary teaching population represents it fairly accurately. On the other hand, the number of teachers rated is very much too small. There is every reason to believe that the rating officers have done the best they could in differentiating their teachers for us. If they have not succeeded in all cases as well as it seems to us they should, their effort is of value in showing what results may be accomplished under present conditions and gives us a starting-point for future development.

*Method of correlation.*—In bringing these ratings together and determining the correlations between the ratings in general merit and the ratings in the qualities, the material was taken through the following steps:

1. The ratings for each school were brought together on one sheet in a series of small double frequency tables, samples of which are shown in Tables IX and XVI. Each table shows the distribution of the teachers in that school with respect to General Rating (ranks numbered from bottom to top) and to rating in one of the 45 qualities of merits (ranks numbered from left to right).

2. The small tables for each quality in the 39 individual distributions were then combined into a series of 45 larger double frequency tables, one for each quality. Samples of these are shown in Tables XI-XIII.

3. The calculation of the Pearson coefficient of correlation from these tables was a comparatively simple matter.<sup>1</sup> The correlation formula used was

$$r = \frac{E(xy)}{\sqrt{Ex^2} \sqrt{Ey^2}}.$$

*The relation of qualities of merit to general merit.*—The correlations resulting from the foregoing processes are given in Table X. The arrangement of the 45 qualities is the same as in the score card. Opposite each factor is its coefficient of correlation with general merit and a number indicating the rank of that correlation in the group. The relative ranking of the qualities is shown graphically in the same table.

It will be noticed at once that the qualities having the highest correlation with general merit are those of the "Technique of Teaching"

<sup>1</sup> For a complete account of this method of correlation see Thorndike, *Mental and Social Measurements*, 2d ed., pp. 172-77.



professional group rank as high as the technical qualities. Discipline ranks twelfth, but its correlation of 0.79 is very little below those of the qualities ranking immediately above it. The curve of relationship rises as it moves from the general personal qualities in the first part of the schedule to those having more particular bearing on teaching work.

*The correlations examined.*—A closer inspection of our data in their immediate relation to these correlations will reveal the reasons for their present ranking. Tables XI, XII, and XIII show the distribution of the teachers in qualities which rank in three different parts of the list. Skill in Teaching How to Study ranking high (7th), Co-operation and Loyalty from the middle of the list (28th), and Health which ranks low (39th). The correlations depend on the degree in which the ratings in the two categories general merit and quality merit tend to be the same. If they were exactly the same, they would be arranged in a diagonal from 10-10 to 1-1 and the correlation would be perfect or 1.00. If those ranking high in one ranked correspondingly low in the other, the ratings would be arranged in a diagonal from 10-1 to 1-10 and the correlation would be negative or -1.00. If they are scattered by chance over the 100 possible combinations, the correlation would be 0. We find all these correlations to be positive, ranging from +0.38 to +0.88. The correlations are higher as the ratings tend to cluster along the diagonal 10-10 to 1-1, and lower as they are scattered from that diagonal.

Skill in Teaching How to Study is one of those qualities in which the ratings in the quality tend to be the same as the General Ratings. Co-operation and Loyalty and Health are more and more scattered. This same difference is shown graphically in Figs. 7, 8, and 9, corresponding to Tables XI, XII, and XIII. In these figures we see the relation between the medians of the two sets of ratings. The solid line in each figure connects the medians of the ratings in the quality which belong to each degree of general excellence. The dotted line connects the medians of the general ratings corresponding to each degree of excellence in the quality. The nearer these two relation lines are together the greater the correlation, and vice versa. If we let these medians stand for the group, we may say from Fig. 7 that the teachers here called excellent have very good Skill in Teaching How to Study, those medium in one are medium in the other, and so on. On the other hand, if we consider Table XI, we find wide variation in individuals. Thus those



SKILL IN TEACHING HOW TO STUDY ( $r = .84$ )

Rank	1	2	3	4	5	6	7	8	9	10	No.
10									5	22	52
9					2		2	38	37	3	61
8			1	1	6	10	29	29	11	2	80
7				2	8	18	27	9	1		65
6			1	5	12	23	9	3			53
5	1	1	5	13	9	2					31
4	1	5	10	3							22
3	2	4	4	1							11
2	2	1									3
1	1										1
No.	1	51	26	57	88	11	28	16	9		N 408

TABLE XI

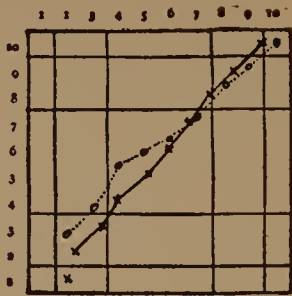


FIG. 7

CO-OPERATION AND LOYALTY ( $r = .66$ )

Rank	1	2	3	4	5	6	7	8	9	10	No.
10								2	1	6	43
9				3		2	2	4	26	49	80
8	7	2	1			1	11	13	20	41	92
7		3	2	3	2	13	14	16	16		60
6				6	2	8	7	12	9		53
5			3	7	5	1	4	6	3	1	32
4	1	5	3	2	3	3	3	1	1		22
3	1		4	2		1	1		1		10
2				1				2			3
1						1					1
No.	1	51	22	21	61	27	91	18	59		N 430

TABLE XII

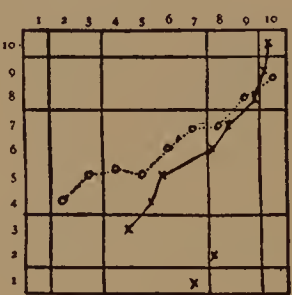


FIG. 8

HEALTH ( $r = .56$ )

Rank	1	2	3	4	5	6	7	8	9	10	No.
10	1				1	2	4	11	8	25	52
9				1	4	2	0	8	33	29	85
8	1		2	3	3	15	24	25	10		92
7			4	3	6	16	10	24	7		70
6		2		5	6	6	11	15	9		54
5			2	4	3	7	8	8	1		33
4			1	3	2	5	3	4	4		22
3				2		4	2	2	2		11
2				2	1			2			3
1					1						1
No.	1	2	17	56	22	99	102	91	56		N 493

TABLE XIII



FIG. 9

graded 8 in General Rating range from 3 to 10 in Teaching How to Study.

Co-operation and Loyalty is a combination of virtues upon which much stress is generally laid by rating schemes. The data here presented indicate that, in this group of 420 teachers, while there is considerable correspondence between co-operation and general merit, most of the group are inclined to co-operate and be loyal. This quality varies much less than their general merit. One finds good and poor teachers ranging from poor to excellent in co-operation.

The same is true of Health. Most of the teachers are in good or excellent health, but this does not make them good teachers. Health is a very important asset in teaching, but the possession of it or the lack of it is little indication of teaching ability.

#### PROFESSIONAL PREPARATION

Rank	1	2	3	4	5	6	7	8	9	10	No.
10			3	1	2	1	7	7	14	16	51
9			3	5	9	6	6	19	22	10	80
8	2	3	6	6	6	10	13	21	10	12	88
7	4	4	5	7	9	15	9	6	7	1	67
6	1		4	15	9	10	5		3	3	50
5	1	1	4	8	8	4	3	3	2		33
4	2	3	1	10	3	1	2	1			23
3			2	3	3	3	2			1	11
2				1	2						3
1								1			1
No.	0	0	0	2	0	0	0	0	0	0	N
											406

TABLE XIV

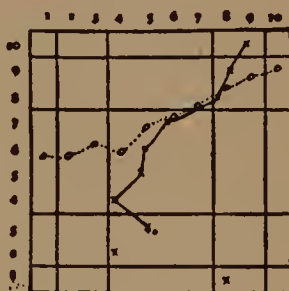


FIG. 10

Most of the qualities which rank in the lower half of the list have their correlation with general merit reduced for this same reason. A striking exception to this is the case of Professional Preparation, which ranks last. The distribution in this quality is shown in Table XIV and Fig. 10.

In Table XIV it is to be noticed that the majority of the teachers are rated Medium or below. The median General Rating corresponding to the various grades of Professional Preparation (dotted line, Fig. 10) drops from Good to Medium. The median Preparation of each grade of general excellence (solid line) drops from Good almost to Poor. The poorest teacher of all has very good professional preparation, being a normal graduate. The position of the curves would indicate more



**Errors of selection:** Errors of this kind are not serious as far as our present problem is concerned. They do, however, prevent the results from being universally applicable for the reason that our sample of the teaching population leaves out that very large part of it found in the small town and country schools. It has been our effort to secure the co-operation of the better judges of teachers in large towns and cities. In this limited field the selection is without doubt quite representative, but the number is a very small proportion of the whole teaching body they represent.

**Errors of judgment:** The greatest source of error is of course in the ratings themselves. Several factors conspire to make the ratings less reliable than they should be to give us absolutely accurate correlations. (1) In the first place, the ratings were, except in eight cases, the first ratings which the officers had made by this method. Greater familiarity with the scheme and more practice would give much more accurate results. (2) The varying standards of the judges have already been commented on. The ratings differ in reliability because some officers with low standards of excellence are easily satisfied and have rated their teachers high, while other officers, with teachers probably actually no worse, have rated their teachers lower because their standards of excellence are higher. (3) Allied to this is the unreliability of judges due to their inability to discriminate different grades of excellence.

The effect of different types of judgment is seen in Table XVI where the teachers in four schools, representing good and poor discrimination, are shown as distributed in three qualities representing low, medium, and high correlation. Schools IVb and XX show poor discrimination, while Schools III and XV show much better discrimination both in general ratings and in the qualities. That is, the type of judgment affects both the general and the particular ratings.

The general effect of these factors seems to be to make the ratings higher than the teachers really deserve. We find the General Ratings distributed as follows:

	Very Poor		Poor		Medium				Good		Excellent
Grade.....	I		2	3	4	5	6	7	8	9	10
Frequency.....	I		3	11	22	33	54	70	92	86	52

HEALTH

$r = .56$

CO-OPERATION

$r = .66$

TEACH. HOW TO STUDY

$r = .84$

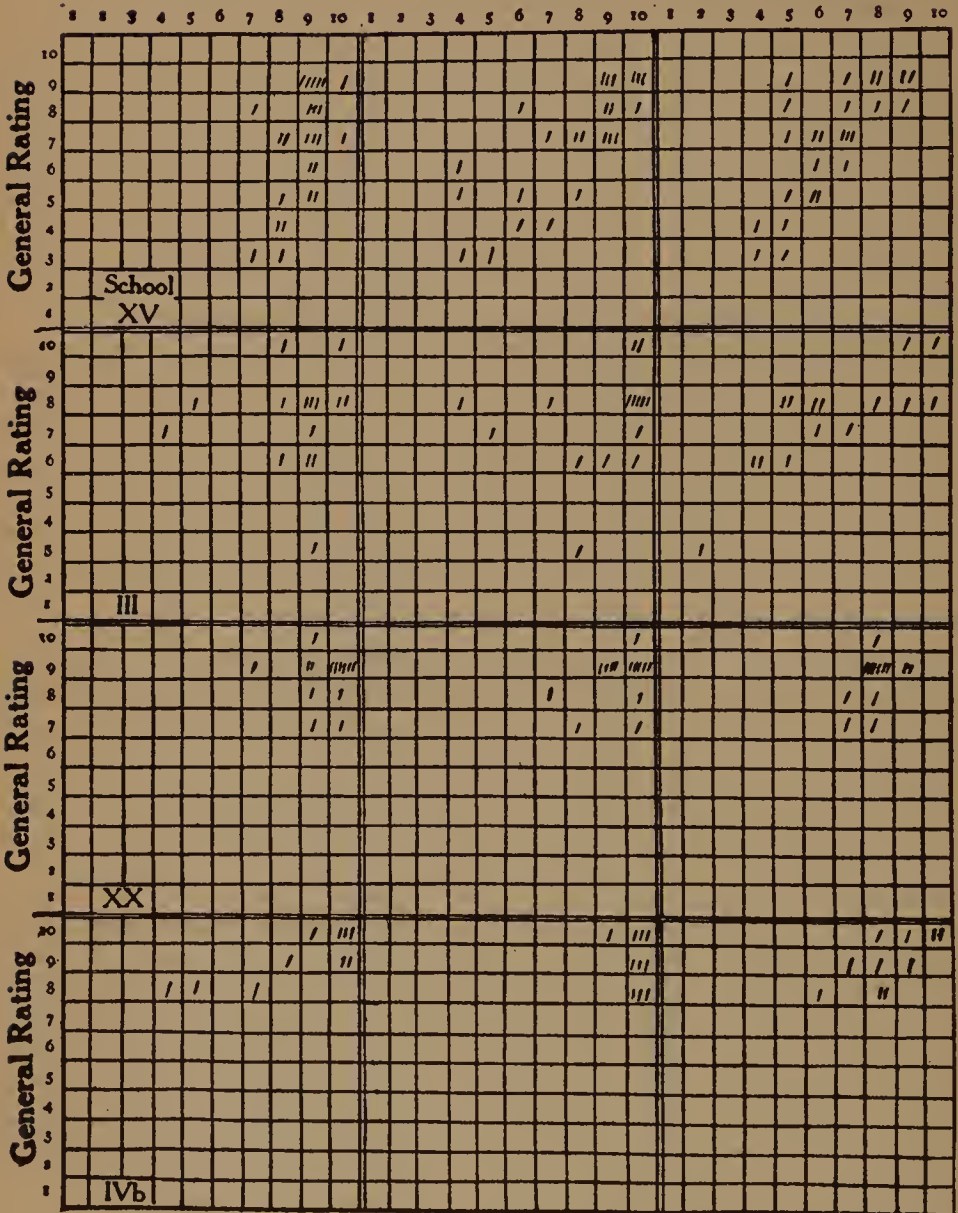


TABLE XVI.—Sample distributions from four schools showing effect of different degrees of differentiation.



Lack of discrimination and generous judgments have, therefore, tended to put teachers in the upper right-hand squares, nearer the diagonal of perfect correlation, thus raising the correlation for the group.

The obvious remedy for these difficulties is to have a body of competent judges trained to a common standard and have them judge the same body of teachers many times; but such conditions have so far been impossible to obtain.

Errors of manipulation: Mistakes in handling the figures in forming the frequency tables and in working out the correlations have, of course, been guarded against by checking them at every possible point. Certainly no constant errors of this kind have been present.

It is probable that the method of correlation employed has counteracted somewhat the effect of the high ratings mentioned above. Since the ratings were subject more or less to the constant error of tending toward sameness when they should have been more widely different, it is important that the method of correlation emphasize the differentiations that were made.

*Results compared with other studies.*—The results obtained by the present method agree with and confirm other studies of the same kind. Unfortunately, no two lists of qualities are the same, but, as far as comparison is possible, we find the following points common to the study by Ruediger and Strayer into qualities of merit in elementary teachers, to that of the present writer in the high-school field, and to the present investigation.

Rank of Quality	Present Study	Boyce—Study of High-School Teachers	Ruediger and Strayer—Study of Elementary Teachers
Instructional skill.....	1	1	2
Discipline.....	2	2	1
Initiative.....	3	3	3
Experience.....	6	4	4
General appearance.....	5	5	5
Health.....	4	6	6

These three studies confirm each other also as to the relation which experience bears to efficiency. The relation seems to be positive for a number of years during which efficiency increases with experience. This positive relation extends to 18 years in the present study, to 20 or 25 in Ruediger and Strayer's results, and to about 15 in the study of

high-school teachers. After this period, the latter part of which may be characterized by rather stationary efficiency, teaching ability begins to decline.

#### SUMMARY

1. The qualities apparently most important in the judging of teaching efficiency are those under the heads of "Results" and "Technique of Teaching."

2. The qualities least associated with general merit are Professional and Academic Preparation and the physical qualities of Health, General Appearance, and Voice.

3. Experience is not equally related to efficiency at all stages. Efficiency increases with experience for 15 or 20 years; after that period, efficiency does not increase in most of the cases of which we have records.

4. The validity of the correlations we have determined is much weakened principally by (1) the small number of cases, and (2) the difficulty of getting accurate ratings.

5. The results of the present study confirm those obtained by others as to the importance of the teacher's technique and her ability to get results.

## CHAPTER VI

### GENERAL SUMMARY AND CONCLUSIONS

The following points are apparently most important as resulting from our study of the problem up to this point.

1. The relative merits of teachers are determined almost altogether by some sort of "rating" or estimation by supervisory officers. For the most part this judgment is formed by general impressions and is not a result of an analysis of the situation.

2. The need for analysis is recognized by many schools, as shown by their methods of reporting efficiency. The weaknesses of these schemes now in use have to do principally with (a) their choice of terms, resulting in inadequate analysis, (b) the lack of definition of terms, resulting in vagueness and indefiniteness, and (c) the method of recording judgments, which is frequently wasteful of time or inaccurate or uncontrolled or all three.

3. The method of rating proposed in this study overcomes to some extent the difficulties involved by a comprehensive list of qualities, careful definition of terms, and the graphical method of recording judgments. When a large number of school officials use the scheme, however, the following weaknesses appear in the ratings: (a) Ratings which should be the same or nearly the same may differ widely because of differing standards of excellence in the minds of different rating officers. (b) School officials are not equally able to judge teachers and discriminate carefully between their various qualities.

4. The tests show that comparable and uniformly accurate reports on teaching efficiency are not to be had at present and that, to obtain them, supervisors have to be trained to a similar standard of excellence and given a common fund of information.

5. When the relation between general merit and the various qualities of merit is determined on the basis of ratings by the graphical method proposed, the following relations appear: (a) The supervisors co-operating in this study have put most emphasis on results obtained and technical skill displayed and least on the more general personal factors. (b) In general, increased professional preparation increases efficiency, but the correlation is low because of the widely varying preparation of the teachers rated. (c) Experience is positively related to efficiency for only part of a teacher's career.

## APPENDIX

### SAMPLE SCORE CARDS FOR RATING TEACHERS

Two sample score cards for rating teachers are here presented. The first is one proposed by Professor E. C. Elliott, of the University of Wisconsin. It is a tentative scheme for measuring teaching efficiency which has attracted much attention and which has been widely used as a pattern. A few places have been found to use the scheme as a whole.

The plan was originally presented in 1910. The copy given here is of the latest edition, which is not materially different from the first, except that the section "Supervisory Efficiency" has been added with a consequent rearrangement of the values.

#### PROVISIONAL PLAN

##### FOR THE

#### MEASURE OF MERIT OF TEACHERS

EDWARD C. ELLIOTT

The University of Wisconsin

City (District)..... School..... Room.....  
 Teacher..... Grade..... Subject.....  
 No. of Pupils..... Boys...  
                                     Girls... Date.....  
 Special conditions.....  
 .....

#### GENERAL INSTRUCTIONS

*Deduct from possible 10; very slight, 2; slight, 4; marked, 6; very marked, 7; extreme, 8. (Possible 20, 40, 60, 80, or 100, in same proportion.)*

*Total efficiency*=Total Individual Efficiency *plus* Total Directed Efficiency.

*Minimum standard for approval; according to the standards and exigencies of the school or school system.*

Individual Efficiency—800 Units	Suggested Values	Deficiencies	Determined Values
I. PHYSICAL EFFICIENCY—80 units	(80)	.....	.....
1. Impressions—general.....	10	.....	.....
2. Health—general.....	20	.....	.....
3. Voice.....	20	.....	.....
4. Habits—personal.....	10	.....	.....
5. Energy and endurance; power of relaxation.	20	.....	.....

PROVISIONAL PLAN—*Continued*

Individual Efficiency—800 Units	Suggested Values	Deficiencies	Determined Values
<b>II. MORAL—NATIVE EFFICIENCY—100 units</b>	(100)	.....	.....
1. Self-control.....	20	.....	.....
2. Optimism—enthusiasm.....	20	.....	.....
3. Sympathy—tact.....	20	.....	.....
4. Industry—sense of responsibility.....	10	.....	.....
5. Adaptability.....	10	.....	.....
6. Sense of humor.....	10	.....	.....
7. Judicial mindedness.....	10	.....	.....
<b>III. ADMINISTRATIVE EFFICIENCY—80 units</b>	(80)	.....	.....
1. Regularity at post of duty.....	10	.....	.....
2. Initiative; resourcefulness.....	20	.....	.....
3. Promptness and accuracy.....	10	.....	.....
4. Executive capacity.....	20	.....	.....
5. Economy (time, property).....	10	.....	.....
6. Co-operation (associates and superiors).....	10	.....	.....
<b>IV. DYNAMIC EFFICIENCY—180 units</b>	(180)	.....	.....
1. Preparation, Including: (a) intellectual capacity; (b) academic education; (c) professional training; (d) command and use of English.....	20	.....	.....
2. Professional attitudes and interest.....	10	.....	.....
3. Human nature attitudes and interest (Appreciation of values—physical, intellectual, social, and moral, in child life)...	10	.....	.....
4. Instructional skill.....	80	.....	.....
Including:			
a) Definiteness of aim and procedure			
b) Attention and interest of pupils			
c) Formality vs. vitality of instruction			
d) Motor vs. verbal methods			
e) Application of the technique of teaching; organization and presentation of subject-matter; the recitation as an <i>artistic</i> product			
f) Application of the technique of living; extent and quality of participation and contribution of pupils; the recitation as a <i>democratic activity</i>			
g) The tools and machinery of instruction; effective adaptation			
h) Assignment of work			
5. Responsiveness to directions and suggestions	20	.....	.....
6. Governmental and directive skill (discipline)	40	.....	.....
<b>V. PROJECTED EFFICIENCY—50 units</b>	(50)	.....	.....
1. Economical oversight of pupils not immediately under instruction.....	10	.....	.....



PROVISIONAL PLAN—Continued

Individual Efficiency—800 Units	Suggested Values	Deficiencies	Determined Values
2. Continuing preparation . . . . . (a) Daily; (b) Weekly; (c) Annual	10	.....	.....
3. The school program . . . . .	10	.....	.....
4. Increase of professional equipment (professional association, study and reading; travel) . . . . .	20	.....	.....
<b>VI. ACHIEVED EFFICIENCY—250 units</b>	(250)	.....	.....
1. Respect of pupils and community . . . . .	30	.....	.....
2. Leadership; stimulation of individuals and community . . . . .	30	.....	.....
3. School achievement			
a) Responsiveness of pupils; readiness and accuracy . . . . .	30	.....	.....
b) Illustrative results . . . . .	80	.....	.....
c) Examinations; rate and amount of progress of pupils . . . . .	80	.....	.....
<b>VII. SOCIAL EFFICIENCY—60 units.</b>	(60)	.....	.....
1. Intra-mural interests . . . . .	30	.....	.....
2. Extra-mural interests			
a) Cultural and ethical . . . . .	10	.....	.....
b) Civic . . . . .	10	.....	.....
c) School—patrons . . . . .	10	.....	.....
<b>Total Individual Efficiency . . . . .</b>	<b>800</b>	.....	.....

Directed Efficiency—200 Units	Suggested Values	Deficiencies	Determined Values
<b>I. SUPERVISORY EFFICIENCY—200 units</b>	(200)	.....	.....
1. Constructive criticism . . . . .	40	.....	.....
2. Non-interfering supervision . . . . .	40	.....	.....
3. Community encouragement . . . . .	40	.....	.....
4. Professional confidence . . . . .	40	.....	.....
5. Recognition of individuality . . . . .	40	.....	.....
<b>Total Directed Efficiency . . . . .</b>	<b>200</b>	.....	.....

SUMMARY

Determined Individual Efficiency . . . . .	..... units
Determined Directed Efficiency . . . . .	..... units
<b>Total Efficiency . . . . .</b>	<b>..... units</b>

## SPECIAL NOTE

It is believed that this analytical plan for the study of teaching merit will be of the greatest service if placed directly in the hands of teachers for their own guidance, and as a basis for co-operative effort between teachers and supervisors. *The plan is not intended to be used as a score card by inspectors.*

While the numerical values assigned to the several items are thought to represent general proportional worths, they may be considered as arbitrary, and as affording merely a convenient device for the recording of objective judgments and for the better diagnosis of defects.

(Copyrighted, 1914, by Edward C. Elliott)

The second score card is one used by certain representatives of the New York Bureau of Municipal Research in some of their investigations. The contents of the front and reverse of the card are shown on pp. 82-83.

SCHOOL	GRADE	H. S. YEAR	TEACHER	DATE																																								
<b>I. PERSONALITY OF TEACHER (Check ✓)</b>		<b>ILLUSTRATIONS</b>																																										
<b>1. Teacher appears to be</b> vigorous..... weak..... poised..... nervous..... neat..... slovenly..... at ease..... embarrassed...																																												
<b>2. Voice is (Check ✓)</b> pleasing..... harsh..... clear..... indistinct..... low..... high.....																																												
<b>3. In her personal relations with pupils does she appear (Check ✓)</b> to stimulate..... to suppress..... to win cordial co-operation..... to antagonize..... to be sympathetic..... harsh..... strict..... lax..... even tempered..... irritable..... reasonable..... unreasonable..... tolerant..... intolerant..... dignified..... undignified.....																																												
ILLUSTRATIONS																																												
<b>II. THE RECITATION</b>																																												
<b>1. No. of pupils in class appearing</b> to be interested..... indifferent..... energetic..... lazy..... independent..... dependent.....																																												
<b>2. Responses of pupils: No. giving</b> (a) fluent topical recitations..... (b) word or phrase responses..... (c) sentence responses..... (d) incoherent responses..... (e) failing to answer.....																																												
<b>3. No. of pupils in section</b> not reciting..... reciting once..... twice..... three times..... more than three times.....																																												
<b>4. No. pupils in room but not in reciting section</b> No. industrious..... indolent..... minding their own business..... interfering with others.....																																												
<b>5. No. of pupils asking</b> pertinent questions of fact..... relevant thought-provoking questions.....																																												
<b>6. Time lost (Check ✓ under yes and no)</b>																																												
<table border="1"> <thead> <tr> <th>Yes</th> <th>No.</th> <th>No. Min.</th> <th>ILLUSTRATIONS</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> <td>(a) Calling class.....</td> </tr> <tr> <td></td> <td></td> <td></td> <td>(b) Dismissing class.....</td> </tr> <tr> <td></td> <td></td> <td></td> <td>(c) Distributing materials.....</td> </tr> <tr> <td></td> <td></td> <td></td> <td>(d) Indistinct speech of teacher.....</td> </tr> <tr> <td></td> <td></td> <td></td> <td>(e) Indistinct speech of pupils.....</td> </tr> <tr> <td></td> <td></td> <td></td> <td>(f) Unnecessary talking of teacher.....</td> </tr> <tr> <td></td> <td></td> <td></td> <td>(g) Unnecessary talking of pupils.....</td> </tr> <tr> <td></td> <td></td> <td></td> <td>(h) Failure to have devices ready.....</td> </tr> <tr> <td></td> <td></td> <td></td> <td>(i) Use of ill-adapted devices.....</td> </tr> </tbody> </table>					Yes	No.	No. Min.	ILLUSTRATIONS				(a) Calling class.....				(b) Dismissing class.....				(c) Distributing materials.....				(d) Indistinct speech of teacher.....				(e) Indistinct speech of pupils.....				(f) Unnecessary talking of teacher.....				(g) Unnecessary talking of pupils.....				(h) Failure to have devices ready.....				(i) Use of ill-adapted devices.....
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			(h) Failure to have devices ready.....																																									
			(i) Use of ill-adapted devices.....																																									

(Reverse side)

		(Check ✓)				Evidence and Remarks
		N	S	M	N	
<b>II. 7. Teaching Ability as shown by</b>						
<b>a) Extent to which teacher's questions are</b>						
(1)	thought-provoking	.....	.....	.....	.....	.....
(2)	calling for facts	.....	.....	.....	.....	.....
(3)	suggesting the answer	.....	.....	.....	.....	.....
(4)	answered by "yes" or "no"	.....	.....	.....	.....	.....
(5)	irrelevant	.....	.....	.....	.....	.....
(6)	not definite—vague	.....	.....	.....	.....	.....
<b>b) Extent to which material of recitation is</b>						
(1)	confined to text	.....	.....	.....	.....	.....
(2)	within pupil's comprehension	.....	.....	.....	.....	.....
(3)	related to children's lives and experiences	.....	.....	.....	.....	.....
(4)	adapted to children's present or future needs	.....	.....	.....	.....	.....
(5)	worth while	.....	.....	.....	.....	.....
<b>c) Extent to which the teaching</b>						
(1)	is rambling	.....	.....	.....	.....	.....
(2)	is formal, mechanical	.....	.....	.....	.....	.....
(3)	stimulates initiative of pupils	.....	.....	.....	.....	.....
(4)	requires independent thinking	.....	.....	.....	.....	.....
(5)	develops pupil's resourcefulness	.....	.....	.....	.....	.....
(6)	requires co-operation of pupils	.....	.....	.....	.....	.....
(7)	is fixed on essentials	.....	.....	.....	.....	.....
(8)	requires pupils to organize material	.....	.....	.....	.....	.....
(9)	utilizes children's experience	.....	.....	.....	.....	.....
(10)	clears up pupils' difficulties	.....	.....	.....	.....	.....
(11)	shows use of material in solution of present or future problems	.....	.....	.....	.....	.....

		(Check ✓)				Evidence and Remarks
		N	S	M	N	
<b>Teaching Ability</b>						
<b>d) Extent to which pupils</b>						
(1)	had a clear idea of purposes of lesson	.....	.....	.....	.....	.....
(2)	were self-reliant	.....	.....	.....	.....	.....
(3)	tested their own solutions	.....	.....	.....	.....	.....
(4)	acted and thought on their own account	.....	.....	.....	.....	.....
(5)	co-operated with teacher and classmates	.....	.....	.....	.....	.....
(6)	persisted in getting desired result	.....	.....	.....	.....	.....
(7)	differentiated between essentials and non-essentials	.....	.....	.....	.....	.....
(8)	organized their material	.....	.....	.....	.....	.....
(9)	seemed well grounded in previous work	.....	.....	.....	.....	.....
<b>8. Was the assignment</b>						
	Yes	No				
a)	definite and clear?	.....	.....	.....	.....	.....
b)	related to present lesson?	.....	.....	.....	.....	.....
c)	such that the pupils were prepared to attack it intelligently?	.....	.....	.....	.....	.....
d)	formal—from textbook?	.....	.....	.....	.....	.....
e)	by topics or problems?	.....	.....	.....	.....	.....
f)	hastily made at dismissal?	.....	.....	.....	.....	.....
g)	omitted?	.....	.....	.....	.....	.....
<b>9. Correction of essential errors</b>						
(1)	Describe method used	.....				
(2)	Are nonessential errors too much emphasized?	.....				
(3)	What record is kept of recurring errors likely to retard progress of pupils?	.....				

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# THE FIFTEENTH YEARBOOK

OF THE  
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OF EDUCATION

## PART I

STANDARDS AND TESTS FOR THE MEASUREMENT  
OF THE EFFICIENCY OF SCHOOLS AND  
SCHOOL SYSTEMS

BY

G. D. STRAYER, BIRD T. BALDWIN, B. R. BUCKINGHAM, M. R. TRABUE  
F. W. BALLOU, D. C. BLISS, H. G. CHILDS, S. A. COURTIS  
E. P. CUBBERLEY, CHARLES H. JUDD, GEORGE MELCHER  
E. E. OBERHOLTZER, J. B. SEARS, DANIEL  
STARCH, G. M. WHIPPLE

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*Edited by GUY MONTROSE WHIPPLE, Secretary*

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THIS PART OF THE YEARBOOK WILL BE DISCUSSED AT THE DETROIT  
MEETING OF THE NATIONAL SOCIETY, MONDAY, FEBRUARY  
21, 1916, 8:00 P. M. IT WILL ALSO BE DISCUSSED AT  
THE DETROIT MEETING OF THE NATIONAL  
COUNCIL OF EDUCATION

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## TABLE OF CONTENTS

	PAGE
EDITOR'S PREFACE . . . . .	7
INTRODUCTION . . . . .	9
GEORGE DRAYTON STRAYER, Chairman of the Committee	
PART I. EDUCATIONAL SCALES AND UNITS OF MEASUREMENT	
CHAP.	
I. A MEASURING SCALE FOR PHYSICAL GROWTH AND PHYSIOLOGICAL AGE . . . . .	11
BIRD T. BALDWIN, Professor of Psychology and Education, Swarthmore College	
II. NOTES ON THE DERIVATION OF SCALES IN SCHOOL SUBJECTS: WITH SPECIAL APPLICATION TO ARITHMETIC . . . . .	23
B. R. BUCKINGHAM, Chief Statistician, Department of Education, New York City	
III. SCORE CARD FOR CITY SCHOOL BUILDINGS . . . . .	41
GEORGE DRAYTON STRAYER, Professor of Educational Administration, Teachers College, Columbia University	
IV. COMPLETION TESTS FOR PUBLIC-SCHOOL USE . . . . .	52
M. R. TRABUE, Instructor in Educational Administration, Teachers College, Columbia University	
PART II. APPLICATION OF SCALES AND UNITS OF MEASUREMENT IN EDUCATIONAL SUPERVISION AND ADMINISTRATION	
V. WORK OF THE DEPARTMENT OF EDUCATIONAL INVESTIGATION AND MEASUREMENT, BOSTON, MASSACHUSETTS . . . . .	61
FRANK W. BALLOU, Department of Educational Investigation and Measurement, Boston, Massachusetts	
VI. THE APPLICATION OF STANDARD MEASUREMENTS TO SCHOOL ADMINISTRATION . . . . .	69
D. C. BLISS, Superintendent of Schools, Montclair, New Jersey	
VII. A HALF-YEAR'S PROGRESS IN THE ACHIEVEMENT OF ONE SCHOOL SYSTEM	
A. THE PROGRESS AS MEASURED BY THE THORNDIKE VISUAL VOCABULARY TEST . . . . .	79
B. THE PROGRESS AS MEASURED BY THE COURTIS TESTS, SERIES B . . . . .	83
H. G. CHILDS, Associate Professor of Education, Indiana University	



CH		PAGE
VIII.	COURTIS TESTS IN ARITHMETIC: VALUE TO SUPERINTENDENTS AND TEACHERS . . . . .	91
	S. A. COURTIS, Supervisor of Educational Research, Detroit, Michigan	
IX.	USE OF STANDARD TESTS AT SALT LAKE CITY, UTAH . . .	107
	ELLWOOD P. CUBBERLEY, Professor of Education, Leland Stanford Junior University	
X.	READING . . . . .	111
	CHARLES H. JUDD, Director of the School of Education, University of Chicago	
XI.	STUDIES BY THE BUREAU OF RESEARCH AND EFFICIENCY OF KANSAS CITY, MISSOURI . . . . .	120
	GEORGE MELCHER, Director of the Bureau of Research and Efficiency, Kansas City, Missouri	
XII.	THE EFFECTS OF EFFICIENCY TESTS IN READING ON A CITY SCHOOL SYSTEM . . . . .	138
	E. E. OBERHOLTZER, Superintendent of Schools, Tulsa, Oklahoma	
XIII.	INVESTIGATION OF SPELLING IN THE SCHOOLS OF OAKLAND, CALIFORNIA . . . . .	141
	J. B. SEARS, Leland Stanford Junior University	
XIV.	STANDARD TESTS AS AIDS IN THE CLASSIFICATION AND PROMOTION OF PUPILS . . . . .	143
	DANIEL STARCH, Assistant Professor of Psychology and Education, University of Wisconsin	
XV.	THE USE OF MENTAL TESTS IN THE SCHOOL . . . . .	149
	GUY MONTROSE WHIPPLE, Professor of Education, University of Illinois	
	CONSTITUTION OF THE NATIONAL SOCIETY FOR THE STUDY OF EDUCATION	161
	MINUTES OF THE CINCINNATI MEETING OF THE NATIONAL SOCIETY FOR THE STUDY OF EDUCATION . . . . .	163
	FINANCIAL REPORT OF THE SECRETARY-TREASURER OF THE NATIONAL SOCIETY FOR THE STUDY OF EDUCATION . . . . .	165
	LIST OF ACTIVE AND HONORARY MEMBERS OF THE NATIONAL SOCIETY FOR THE STUDY OF EDUCATION . . . . .	167
	APPLICATION FOR MEMBERSHIP IN THE NATIONAL SOCIETY FOR THE STUDY OF EDUCATION . . . . .	173

## EDITOR'S PREFACE

It will be recalled that the National Society for the Study of Education one year ago published as its *Fourteenth Yearbook*, Part I, the 1915 report of the Committee of the Department of Superintendence of the National Education Association on Economy of Time in Education, Superintendent H. B. Wilson, chairman. It was anticipated at that time that the policy of this Society in publishing Yearbooks *before* the meeting at which they were to be discussed would measurably augment interest in the report and increase the effectiveness of its discussion. This anticipation was so fully realized that, now that the further report of the Committee on Economy of Time has been unavoidably delayed, it is a matter of satisfaction to be able, nevertheless, to continue our policy by presenting to our members, as Part I of the *Fifteenth Yearbook*, the report of another important committee, the Committee of the National Council of Education of the National Education Association on Standards and Tests of Efficiency, Professor G. D. Strayer, chairman.

The perusal of the Table of Contents will suffice to show that this Yearbook maintains the high standards set by its predecessors in the selection of subject-matter that bears directly upon educational problems of recognized importance and in the selection of contributors that guarantee a presentation worthy of careful consideration.

G. M. W.



## INTRODUCTION

In the pages which follow, the Committee on Standards and Tests of the National Council of Education presents a series of reports prepared by its own members and by others who have, upon invitation of the committee, been willing to contribute results of their study or investigation. The committee feels that these reports furnish most satisfactory evidence of the progress which has been made in the field of educational measurement during the past few years. The papers of the several contributors may, in general, be classified as contributing (1) to the derivation of scales or units of measurement, and (2) to the application of such units or scales of measurement as have been derived in the field of educational administration or supervision. In printing, the papers have been grouped as indicated above.

It seems unnecessary with this report in hand to argue in favor of the use of the more precise methods of measurement which have recently been developed. Those interested in the improvement of our schools have always attempted by some method or other to estimate the efficiency of individual schools or school systems. Often this measurement has been based upon an opinion not acceptable to another student or investigator, and not frequently upon attempts to measure which have been extremely crude. The examination system as we have commonly had it, not only has been responsible for judgments with respect to the efficiency of schools, or of school systems, but has also determined in very considerable measure in most school systems the progress of children. In the studies which are reported here, more precise measures give to the student of education a better basis in knowledge of conditions upon which to base his criticism or to develop his improved method of instruction or administration. The measurement of results of any sort, whether of the achievements in school subjects, of the cost of any unit or function, or of the rate of progress, and the like, furnishes primarily a knowledge of the situation which makes clear the problems involved, and which may suggest a method of experiment that looks toward the improvement desired.

Regardless of the development which may be made in the field of measurement, we shall always have to deal with the problem of aim in

education. Those who have done most to develop precision in measurement, or who have profited most by using the units or scales, would be the last to deny the worth of that thinking and discussion which leads to a determination of the ends to be realized in our schools. When one has defined purposes or ends to be achieved, efficiency, in the light of these aims, can be determined only as we are able to measure the degree to which improvement or growth has taken place. Indeed, education may be best defined in terms of changes which are brought about in the individuals subjected to the process. If our aims mean anything to those who teach, they are or are not satisfied, in proportion as measurable changes are brought about in pupils. The more precisely we are able to measure the development which is brought about by virtue of our school work, the more certain we may be that we are realizing the aims which we have set up, and it is only by means of some sort of measurement that we may even claim to have made progress in the accomplishment of those ends which we profess to seek.

GEORGE DRAYTON STRAYER, *Chairman*



PART I  
EDUCATIONAL SCALES AND UNITS OF MEASUREMENT

---

CHAPTER I  
A MEASURING SCALE FOR PHYSICAL GROWTH AND  
PHYSIOLOGICAL AGE

---

BIRD T. BALDWIN  
Professor of Psychology and Education, Swarthmore College

---

A comparative study of the results of four hundred investigations on over one million individuals shows that the height, weight, and lung capacity of children vary according to nationality, heredity, general social status, urban and rural conditions, geographical distribution, season of the year, normal and abnormal mentality, health, sex, initial size, and stages of physiological maturity. Among the marked modifying factors which have, to a considerable extent, made data incomparable are to be found the manner in which measurements have been taken and recorded; the personal equation of trained and untrained examiners; the varying degrees of accuracy of measuring apparatus; the age of the child, as based on exact birthday, last birthday, or next birthday, with or without months, weeks, and days being taken into consideration; and the measurement of children with or without clothing.

*This paper aims to formulate tangible norms which may be used by physical directors and teachers as standards for comparison with all types and races of children between the ages of five and one-half and eighteen years.* The norms are based on the best available data in this country from the Horace Mann School, the Francis W. Parker School, and the University Elementary and High schools of the University of Chicago, where a limited number of American children were measured consecutively for several years by trained anthropometrists using standardized apparatus of minute units, with the age recorded exactly in days. Details and

source material have been published elsewhere,<sup>1</sup> but the material and charts included in this article are new and supplementary to the previous larger study.

#### GENERAL PRINCIPLES OF GROWTH

These norms, in accordance with facts previously published by the writer, conform with the conclusions that: Boys are taller, heavier, and have better lung capacity than girls except during the early adolescent period, when the converse of this statement is true. The widest ranges of individual differences and the largest increments of growth are during adolescence. Individual growth curves previously published show that in the course of growth short children do not become tall, neither do tall children become short, under normal conditions; each child holds his or her relative position in reference to a given median or norm throughout the school age—that is, in a well-developed child weight, height, and lung capacity are relatively proportionate to each other. If a child's weight is divided by its height, the *weight-height coefficient* is found, which is approximately the same for a well-developed large child or a similarly well-developed small child; the same relationship holds true for the breathing capacity and height or the so-called *vital-height coefficient*. (See score card for norms.)

#### STAGES OF PHYSIOLOGICAL MATURATION OR PHYSIOLOGICAL AGE

Growth is a continuous process, but some periods in the life of a child are marked by more acceleration than others. The period from six to seven and a half is a period of rather rapid growth in height. Boys and girls above median or average height between the ages of six and eighteen grow in stature and physiological maturity in advance of those below the median or average height. There is a shifting of the accelerated period according to the individual's relative height, weight, and lung capacity.

Our study of thirty thousand measurements in height, weight, and lung capacity reveals correlations in growth for boys and girls above the median or average height different from those below. The rhythms and fluctuations of growth in height for the children above the median show that these boys and girls are physiologically older than those

<sup>1</sup> B. T. Baldwin, "Physical Growth and School Progress," *U.S. Bureau of Education, Bulletin No. 10*, 1914. Whole No. 581. 215 pp.

below the median, since their periods of acceleration and arrest begin earlier and end earlier. Short children continue their growth longer than tall children.

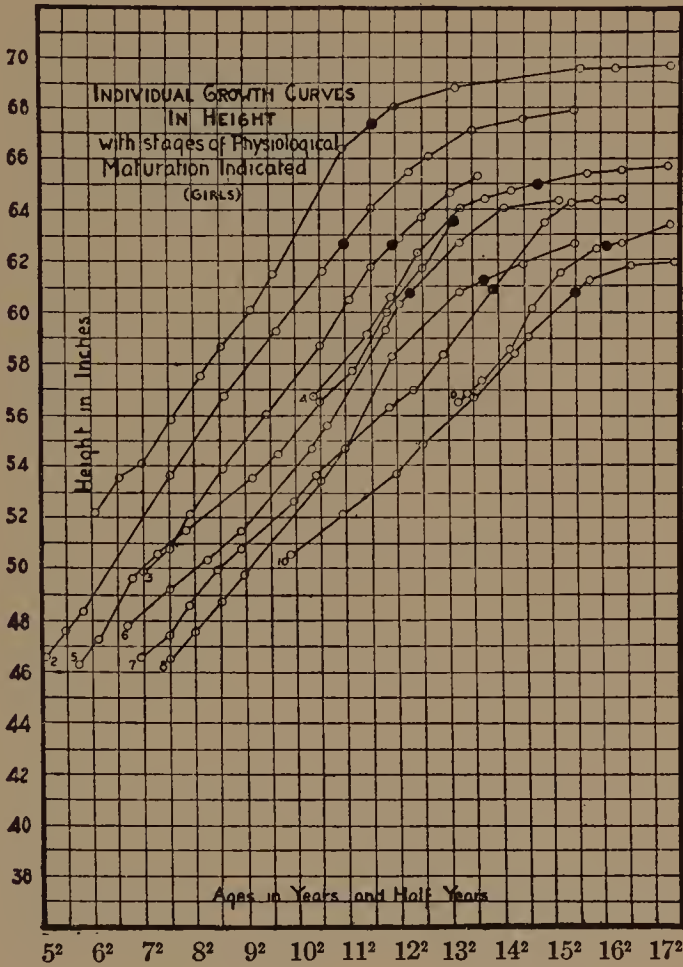


CHART I.—Individual growth-curves

This conclusion may be substantiated in another way. Chart I gives individual growth-curves and the periods of first menstruation of some girls who were selected, on the basis of height only, from a larger group. A study of these curves will show that the taller girls, as a rule, mature earlier than the shorter ones, as shown by the distribution of the advent of first menstruation. It would appear, therefore, that

height, weight, and breathing capacity offer good objective criteria for determining this factor in pubescent development and the onset of maturity. If the girl is tall, healthy, and well nourished, this physical stage may be reached as early as eleven years in a normal girl; if she is tall, but under weight, it may be delayed; if she is very short and markedly light, it may be delayed until sixteen and one-half years of age.<sup>1</sup> This principle of growth has recently been upheld by Weissenberg,<sup>2</sup> who found girls who menstruated before thirteen years of age were, on the average, 150.5 centimeters tall, and those who had not developed so far at fifteen years of age were, on the average, 144.5 centimeters tall. In his study of 1,273 Jews and 768 Russians he found the average of this stage of maturation to be for the Jews fourteen years and two months, and for the Russians fourteen years and eleven months. Jamasaki found the age to be fifteen for Japanese girls and seventeen for Chinese, on the average. All of these are relatively short peoples. These differences in ages are no doubt also greatly influenced by racial and climatic conditions.

In order to determine the wide range of ages which are characteristic of the stages of physiological growth which are entered into at the age of adolescence, the writer and one of his advanced students at Johns Hopkins University, Charles F. Pennington, checked very carefully some material that was gathered by Director William Burdick and Dr. Brown on the ages of pre-pubescence, pubescence, and post-pubescence in boys.<sup>3</sup> In Baltimore 3,600 boys of a "motor" type of development, that is, those taking part in athletics, were examined and checked by Dr. Burdick and supplemented by a group of 1,317 boys from 14 counties of Maryland. Various criteria have been used to determine the age of pubescence, such as examination of the teeth, the bones of the wrist, the change of voice, the color of the eye, and the acceleration in height, weight, and lung capacity. With this particular material the

<sup>1</sup>The coefficient of correlation for these ten cases by the Spearman Formula,  $R = 1 - \frac{\sum g}{(n^2 - 1)}$ , is .697.

<sup>2</sup>S. Weissenberg, *Das Wachstum des Menschen*. Stuttgart: Strecker und Schröder, 1911. 220 pp.

<sup>3</sup>These data were collected under the auspices of the Baltimore Public Athletic League of which Mr. Robert Garret is chairman and Drs. Burdick, Brown, Horrax, and Thompson are medical supervisors.

criterion was that of pubescent growth and pigmentation of fine hair, which characterizes a very brief period of time marking the change from asexual to sexual life, when the ability to procreate is established.

Chart II (see p. 16) gives the results of this investigation. Curves 1, 3, and 5, solid lines, represent the 1,317 country boys. Curves 2, 4, and 6, dotted lines, represent the 3,600 city boys. It will be noticed that the pre-pubescent boys range from eight and one-half to sixteen years of age in the group of country boys, and from nine and one-half to seventeen and one-half for the city boys. The post-pubescent ages range from eleven and one-half to twenty-four for the country boys and twelve and one-half to twenty-four for the city boys. For the pubescent stages the country boys range from nine and one-half to fifteen and one-half, with the mode at thirteen and one-half, and the city boys from ten to eighteen, with the mode at fourteen. The average is 13.86 years for the country boys and 14.40 years for the city boys. Crampton<sup>1</sup> found the mean age for pubescence (maturing) for New York boys to be 13.44 years, with a range from twelve and one-half to seventeen and one-half years.

The table shown on p. 17 gives the distribution of 1,241 pre-pubescent, pubescent, and post-pubescent girls from the Baltimore Public Athletic League where the criteria were the menstrual flow, the appearance of subcutaneous fat, enlargement of the breasts, and axillary hair.

All this material indicates that averages are of little value in the study of physical development. What is needed are individual growth records, for each individual must be studied on the basis of his own development. Two children fifteen years of age may vary from each other at least four years in their stages of physiological development—a fact which should be taken into consideration in all educational work, whether physical or mental. The results of the writer's previous study show that the stages of physical and mental maturity are parallel, irrespective of precocity or brightness; therefore, the obvious educational corollary is that our school systems, public and private, should take into careful consideration *the physiological age and the accompanying stages of mental maturity* of boys and girls, rather than the chronological age and brightness, as is now done. This would require that tall,

<sup>1</sup> C. W. Crampton, "Anatomical or Physiological Age versus Chronological Age," *Ped. Sem.*, XV, 230-37.



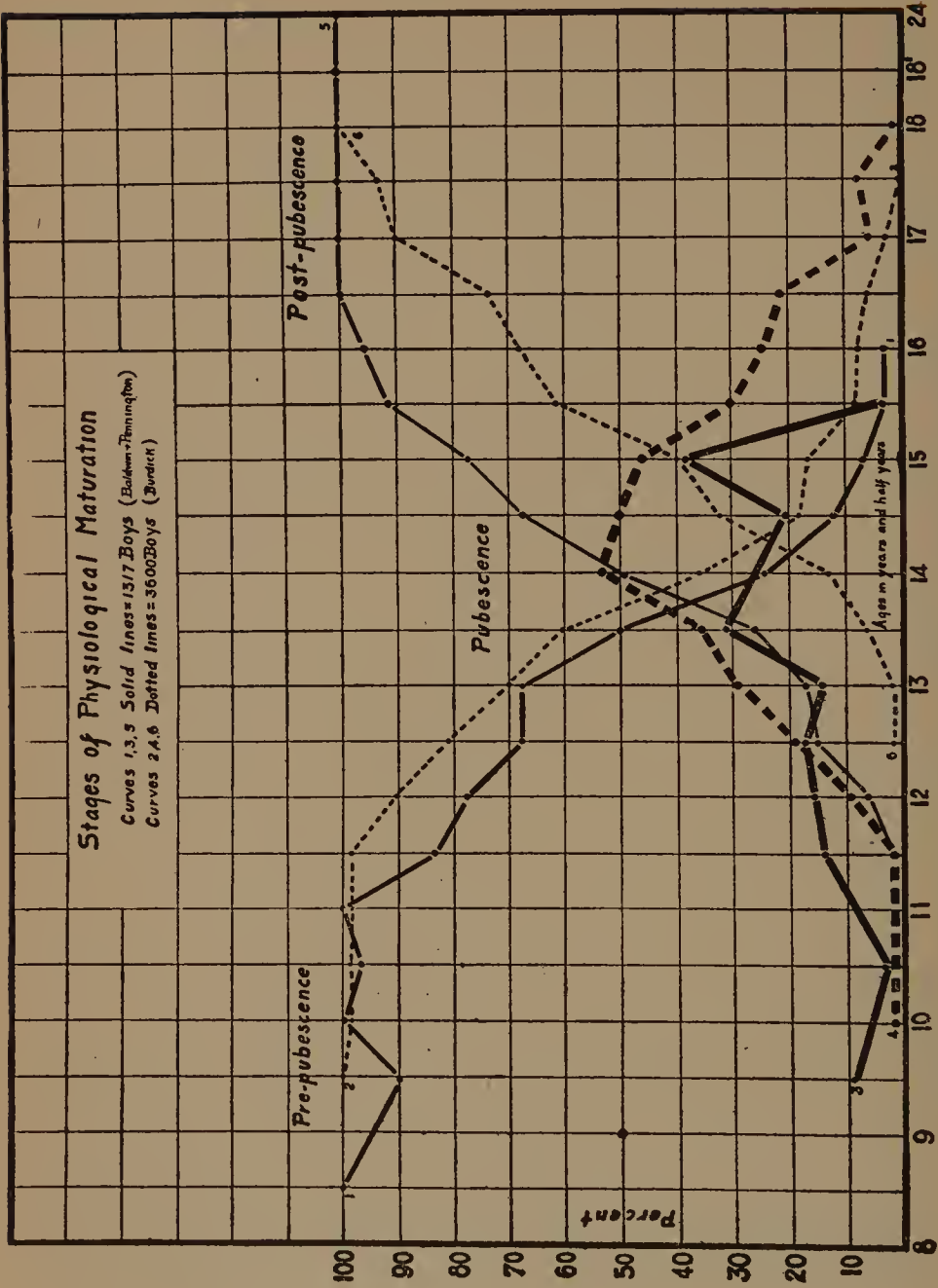


CHART II.—Distribution chart of pre-pubescent, pubescent, and post-pubescent boys

healthy children of accelerated physiological development be encouraged to proceed through school as rapidly as possible within the limits of thoroughness, and that the small, light children of retarded physiological

## APPEARANCE OF PUBESCENT CHANGES IN 1,241 GIRLS

Age	No. Pre-pubescent	Percentage	No. Pubescent	Percentage	No. Post-pubescent	Percentage
6½.....	4	100.0	.....	.....	.....	.....
7.....	12	100.0	.....	.....	.....	.....
7½.....	16	100.0	.....	.....	.....	.....
8.....	6	100.0	.....	.....	.....	.....
8½.....	26	100.0	.....	.....	.....	.....
9.....	22	100.0	.....	.....	.....	.....
9½.....	37	100.0	.....	.....	.....	.....
10.....	26	100.0	.....	.....	.....	.....
10½.....	45	93.75	3	6.25	.....	.....
11.....	27	100.0	.....	.....	.....	.....
11½.....	41	78.84	10	19.23	1	1.92
12.....	18	62.06	11	37.93	.....	.....
12½.....	39	58.20	16	23.88	12	17.91
13.....	17	39.53	15	34.88	11	25.58
13½.....	10	15.15	25	37.87	31	46.96
14.....	10	15.38	25	38.46	30	46.15
14½.....	3	4.83	11	17.74	48	77.42
15.....	.....	.....	8	14.54	47	85.45
15½.....	1	1.55	5	7.81	58	90.62
16.....	1	2.04	3	6.12	45	91.83
16½.....	.....	.....	2	3.17	61	96.83
17.....	.....	.....	.....	.....	43	100.0
17½.....	.....	.....	.....	.....	43	100.0
18.....	.....	.....	.....	.....	32	100.0
18½.....	.....	.....	.....	.....	33	100.0
19.....	.....	.....	.....	.....	9	100.0
19½.....	.....	.....	.....	.....	25	100.0
20.....	.....	.....	.....	.....	15	100.0
20½.....	.....	.....	.....	.....	18	100.0
21.....	.....	.....	.....	.....	4	100.0
21½.....	.....	.....	.....	.....	14	100.0
22+.....	1 (22 yrs.)	.60	.....	.....	165	99.4
Total.....	362	.....	134	.....	745	.....
Grand total....	.....	.....	.....	.....	1,241	.....

development be kept below or in the normal grade, doing supplementary work, *since these short, light pupils are immature in mental development, although in many cases precocious in degree of brightness.* It also follows from this study that rapid, healthy growth favors good mental

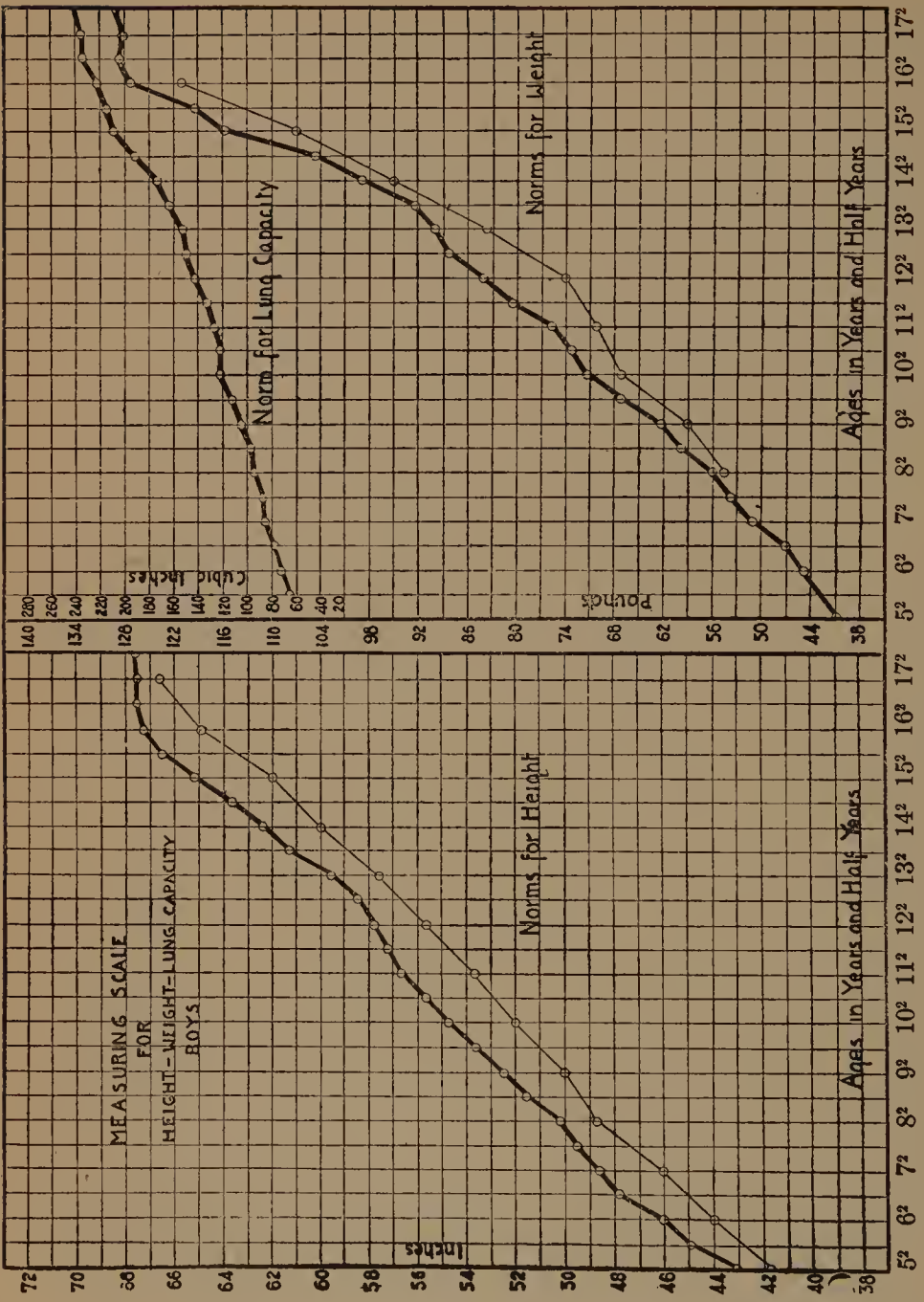


CHART III.—Average growth-curves in height, weight, and lung capacity. The heavy lines are Baldwin's and the light lines are those of Boas. (Place the child's measurements in the assigned spaces on the card and plot the growth-curves on this chart from year to year.)

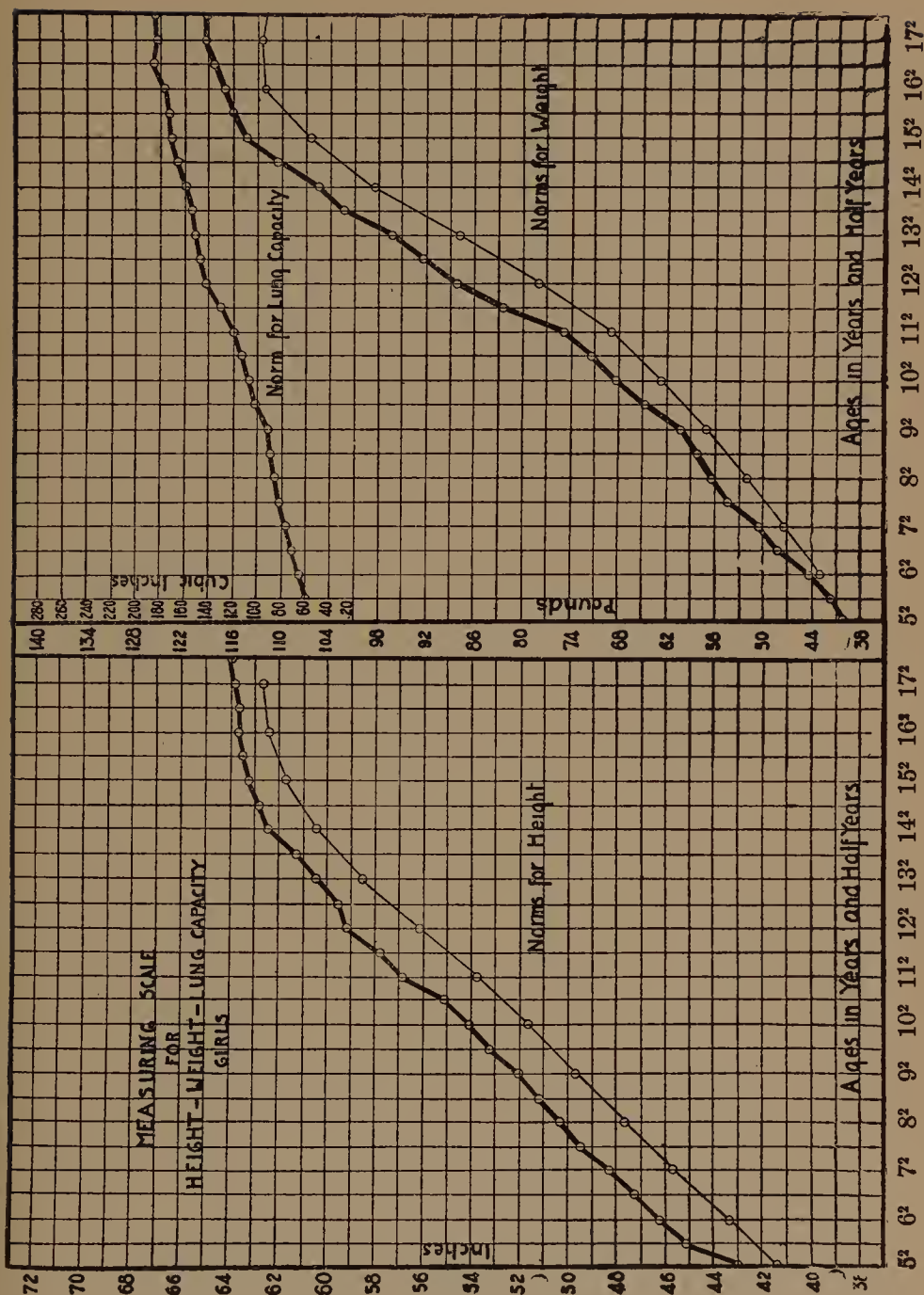


CHART IV.—Average growth-curves in height, weight, and lung capacity. The heavy lines are Baldwin's and the light lines are those of Boas. (Place the child's measurements in the assigned spaces on the card and plot the growth-curves on this chart from year to year.)

MEASURING SCALE FOR PHYSICAL DEVELOPMENT (GIRLS)

Name.....English System

Date of Birth.....Nationality.....Examiners.....

Form 1

Date of examination.....	1		2		3		4		5		6	
School year.....	Kg.		7		8		9		10		11	
Age.....	5 <sup>a</sup>	6	6 <sup>a</sup>	7	7 <sup>a</sup>	8	8 <sup>a</sup>	9	9 <sup>a</sup>	10	10 <sup>a</sup>	11 <sup>a</sup>
Norm in inches.....	42.9	45.2	46.3	47.2	48.3	49.4	50.4	51.1	52.0	53.3	54.0	56.9
Height.....												
Weight-height coefficient.....	.93	.92	.95	1.02	1.04	1.11	1.13	1.13	1.18	1.22	1.33	1.49
Norm in pounds.....	40.1	41.7	44.2	48.1	50.4	54.7	57.1	57.5	61.5	64.8	71.7	82.8
Weight.....												
Norm in cubic inches.....	40.0	60.0	63.0	71.3	77.9	81.8	83.5	87.3	91.7	100.9	106.7	119.0
Breathing capacity.....												
Vital-height coefficient.....	.93	1.33	1.36	1.51	1.61	1.65	1.66	1.71	1.76	1.89	1.98	2.09
Date of examination.....	7		8		9		10		11		12	
School year.....												
Age.....	12	12 <sup>a</sup>	13	13 <sup>a</sup>	14	14 <sup>a</sup>	15	15 <sup>a</sup>	16	16 <sup>a</sup>	17	17 <sup>a</sup>
Norm in inches.....	57.7	59.3	59.5	60.5	61.3	62.5	62.6	63.3	63.5	63.7	63.4	63.9
Height.....												
Weight-height coefficient.....	1.51	1.55	1.62	1.69	1.73	1.76	1.84	1.83	1.84	1.85	1.86	1.87
Norm in pounds.....	87.1	91.8	96.4	102.3	105.8	110.3	115.3	115.6	116.9	117.9	119.0	119.0
Weight.....												
Norm in cubic inches.....	128.0	141.3	146.2	147.7	153.5	158.8	164.5	172.6	176.5	178.8	183.0	185.0
Breathing capacity.....												
Vital-height coefficient.....	2.22	2.38	2.46	2.44	2.50	2.54	2.63	2.73	2.78	2.81	2.89	2.90

School year.....1 2 3 4 5 6 7 8 9 10 11 12

Health.....Vision.....Hearing.....

Vaccination.....Glands.....Posture.....

Note: G = Good M = Medium P = Poor C = Corrected

These norms represent well-developed children with school-medical inspection and physical training. A small child for a given age may be well developed if the coefficients, height, weight, and breathing capacity relationships, are normal and approximate those indicated. The formula is  
Breathing capacity ÷ height = vital-height coefficient.  
Weight ÷ height = weight-height coefficient.  
For example, For 5<sup>a</sup> years, 41 lbs ÷ 43 in. = .95 = weight-height coefficient.  
In the metric system use height in centimeters, weight in kilograms, and breathing capacity in liters. The English weight-height coefficient norms × .179 = metric weight-height coefficient norms. The English vital-height coefficient norms × .0045 = metric vital-height coefficient norms.



## English System

Form I

Name..... Schools.....  
Date of birth..... Nationality.....  
Examiners.....

[illegible]

School year.....	I	2	3	4	5	6	7	8	9	10	11	12		I	2	3	4	5	6	7	8	9	10	11	12
Health.....													Vision.....									Hearing.....			
Vaccination.....													Glands.....									Posture.....			

Note: G=Good M=Medium P=Poor C=Corrected.

development, and therefore that the healthy growing child should have plenty of physical and mental exercise.

#### THE MEASURING SCALE

In order that teachers, principals, superintendents, physical directors, and parents may have a basis for comparison in the study of physical development, the writer has formulated norms for physical growth in height, weight, and lung capacity, and expressed them on the accompanying cards (pp. 20-21), which may be used as a *measuring scale* for physical growth and stages of physiological maturity, as well as for records concerning physical conditions. The norms are high, representing the best developed children available, who have had physical training, school-medical inspection, directed play, and remedial treatment where necessary. A child who falls short of these standards is not necessarily subnormal physically, providing its weight and breathing capacity are proportionate to its height. The weight-height coefficients and the vital-height coefficients indicated on the card under their respective ages mark the norm to which all well-developed children should approximate.<sup>1</sup> All these norms are based upon measurements of nude children.

<sup>1</sup> Measuring scales for the growth of boys and girls have been prepared in the metric system and may be had from the writer on application. An illustrated leaflet describing methods of measuring and tests for nutrition, vision, hearing, neck-glands, and posture may also be obtained from the writer.

## CHAPTER II

### NOTES ON THE DERIVATION OF SCALES IN SCHOOL SUBJECTS: WITH SPECIAL APPLICATION TO ARITHMETIC

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The movement to set up objective means of measuring school products, which has been so characteristic of recent educational practice, has plainly demonstrated the necessity for more and better instruments of measurement. It is in response to this need that standards of achievement have been set up, and scales have been derived. The latter have been of two kinds—those based upon the judgment of competent persons, and those based upon the ratio of correct to total responses in a typical group. The validity of each of these bases has been questioned, but not successfully. The superiority of the one over the other has been argued, but not conclusively. In fact, there is no opposition between them.

The determination of the ratio of correct responses to total responses is also, to some extent, dependent upon individual judgment, because it is frequently a matter of opinion whether a response is correct or not. In the matter of spelling, for instance, it is not always easy to say whether a given form is or is not to be scored as correct. Again, in arithmetic, which, like spelling, is capable of relatively precise rating, it is frequently difficult to decide whether the answer to a problem should be rated as correct. In such cases readers of papers will differ somewhat in their conclusions. In other words, the element of individual judgment plays a part. Furthermore, such subjects as geography, history, and English offer much greater degrees of difficulty in the application of that precision of rating upon which the ratio method of deriving scales is based.

Finally, in the gradation of school subjects from the most definite subjects (spelling and arithmetic) to the least definite ones (penmanship, drawing, and English composition), we reach subjects in which the element of certainty is at a minimum, and judgment plays its most important rôle.

The point which I am seeking to make is this: that there is no opposition between scales based upon judgment and those based on the ratio of correct to total responses, and that each method of derivation is most appropriate at the extremes of a series of school subjects ranging from most definite to least definite.

On the score of penmanship, drawing, and English composition, a given specimen of work is superior to another, not because it is more correct, but just because people think it is superior. On the other hand, in the case of spelling, a list of words written by one child is better in point of spelling than a list written by another child, not because a number of judges think it is the better, but because there are actually more words spelled correctly in it.

In those subjects that range between the extremes of definiteness (such subjects, namely, as geography, history, and grammar) it will be evident that there is place for both the judgment and ratio methods of scale-derivation. In each of these subjects there are certain parts which are so definite and about which people differ so little that there is small room for variation in judgment. In geography, for example, locational features are of this type. It is no more possible for people to differ about the state of the United States in which Kalamazoo is than it is for them to differ about the correct spelling of "separate" or the product of seven and nine. Similarly, in history, the question "In what year was the Stamp Act passed?" admits of no debate. And, again, in grammar, the direction "Give an example in a sentence of an adverb of time, and underline it" admits of responses which may be classified, with practical certainty, as either right or wrong.

It will be noted that the questions just mentioned call for responses based on information, and it is a fact that most questions which may be rated with precision as either right or wrong are of this kind. It is obvious, however, that a large part of geography, and perhaps a still larger part of history and grammar, cannot be covered by questions of this character. Indeed, the most valuable training to be derived from these subjects is based upon the opportunity which they afford for comparison, for inference, and for judgment.

But there is no good reason why scales based upon the ratio idea should not be derived for those phases or parts of these subjects that are susceptible of the precise treatment which the ratio idea requires. In fact, it is becoming increasingly evident that the present general scales

will have to give place to more specific ones, each scale being suitable for a particular purpose and applicable to a given condition or situation. We shall have scales for each grade in spelling, scales for the several styles of handwriting, and scales for each type of discourse in composition. Why, then, should we not have scales for information in geography, history, and grammar?

The suggestion may be made at this point that in using scales based upon information, we may not only directly measure ability to give information, but we may also indirectly measure ability of a more general sort, including the power to think. Work is now being done on the problem of the correlation between information and general ability within a school subject. From present indications there is reason to suppose that the correlation is high—probably not less than 0.80. If this is substantiated by sufficient data, it then becomes reasonably easy to measure something like general ability in a given field in terms of a scale derived from questions of information.

The practicability of indirect measurement is demonstrated in many of our ordinary measurements. We do not measure, for instance, the heat of the atmosphere, but, rather, the length of a mercury column, which varies directly with the amount of heat to which it is subjected. We do not measure the health of a child, but, rather, his vital index, because we either know, or think we know, that his health varies approximately with this index.

When we use the phrase “varies directly,” we are stating a condition which involves perfect correlation. No such perfect correlation, of course, exists between mental processes. A measure, therefore, of one process, trait, or ability in terms of another, is liable to a margin of error to the extent that the correlation is imperfect. If we may assume that the correlation between information and thought-power in geography is 0.80, we cannot get a perfect measure of “thought-power” from “amount of information,” but we can get a measure which differs from the true one by an amount small enough to be negligible for many practical purposes.

With these ideas in mind, an investigation was begun in the fall of 1913, which had for its purpose the development of standardized material and the derivation of scales in the subjects of arithmetic, geography, history, and grammar, upon the basis of the ratio of correct to total responses to given questions. It is to be understood that in the rating



of pupils' papers, all answers were scored as either correct or not correct, and that no part credits were given.

The report herewith submitted is preliminary and fragmentary. It is preliminary because it is not believed that a sufficient number of cases have been scored to make the conclusions as reliable as they should be. It is fragmentary because results are shown only for the subject of arithmetic, and within this subject, for only a portion of the questions that were used. It is offered here as an example of the extension to a wider field of a previously used method.

The problems used in this report were given to seventh- and eighth-grade children in eight schools in New York City, and to children of the same grades in ten other cities. Not all the problems were used in every city. The number of participants, therefore, varies with different questions. In no case, however, was a problem attempted by less than 5,000 children.

The tests were administered by the class teachers, under instructions. The principal point in the instructions was that the problems were to be written on the blackboard, one at a time, and that ten minutes were to be allowed the pupils for solving each problem.

In rating the papers, children were scored as correct only in case the answer to the problem was correctly given. In a few instances, where the teacher had evidently presented an example incorrectly, and the change did not affect its nature or apparent difficulty, it was scored as correct if the pupils gave the right answer under the changed condition. In the few instances where changes were introduced by the teacher which affected the nature and difficulty of the problem, no record was taken of the results.

The problems listed under Table I were given, in a preliminary test, to children in several cities other than New York City, and in a test of eight schools of a certain type in New York City, on March 23, 1915. In order to distinguish them from the problems shown under Table II, they are called the "March test."

The problems listed under Table II were given, in a preliminary test, to children in a number of cities other than New York City, and were then given, also, to the same eight schools of New York City, on June 24, 1915. For convenience in designation, these problems are called the "June test."

TABLE I

DISTRIBUTION OF CORRECT ANSWERS BY QUESTIONS AND BY GRADES  
ARITHMETIC. MARCH TEST

PROBLEM NUMBERS	SEVENTH GRADE				EIGHTH GRADE				TOTAL	
	FIRST HALF		SECOND HALF		FIRST HALF		SECOND HALF			
	No. of Partici- pants	No. Correct	No. of Partici- pants	No. Correct	No. of Partici- pants	No. Correct	No. of Partici- pants	No. Correct	No. of Partici- pants	No. Correct
1.....	1,526	143	1,798	201	1,296	308	1,304	520	5,924	1,172
2.....	1,526	362	1,788	557	1,296	586	1,304	804	5,924	2,309
3.....	1,525	681	1,635	898	1,177	785	1,261	963	5,598	3,327
4.....	1,527	533	1,636	700	1,177	628	1,260	913	5,600	2,774
5.....	1,527	544	1,636	801	1,177	669	1,260	885	5,600	2,899
6.....	1,594	425	1,577	558	1,198	528	1,248	678	5,617	2,189
7.....	1,594	816	1,577	985	1,198	869	1,248	985	5,617	3,655
8.....	1,594	539	1,604	695	1,214	628	1,248	862	5,660	2,724
9.....	1,594	751	1,604	833	1,214	753	1,248	821	5,660	3,158
10.....	1,594	635	1,604	804	1,214	671	1,248	909	5,660	3,019

The ten problems used in the March test are the following, their numbers corresponding to the numbers in the table above:

1. If a map 10 in. wide and 16 in. long is made on a scale of 50 mi. to the inch, what is the area in square miles that the map represents?

2. Cream is sold in  $\frac{1}{2}$ -pint bottles. If a milkman buys it at \$1.20 a gallon and it costs 40 cents a gallon to bottle and deliver it, at what price per bottle must it be sold to gain 20 per cent?

3. A fruit dealer bought 300 apples at the rate of 5 for a cent, and 300 at 4 for a cent. He sold them all at the rate of 8 for 5 cents. What did he gain on the investment?

4. A family used  $1\frac{1}{2}$  bu. of potatoes a month. How much will be saved each month by buying them at \$1.30 a bushel instead of at 8 cents a quart? (8 qts. = 1 pk.; 4 pks. = 1 bu.)

5. James buys papers at 10 for 6 cents and sells them at 1 cent each. If his sales average 100 a day for 6 days, what does he add to the family income after keeping \$0.10 for himself?

6. The 7A class has 42 on the roll and only 3 absent today; and the 7B class has 48 on the roll with 4 absent. Which has the better percentage of attendance and how much?

7. Bought pencils at \$1.20 per gross, and sold them at 1 cent each. Find the gain per cent.

8. A family pays \$25 a month for a non-heated flat and uses 5 tons of coal at \$7 per ton for heating purposes during the winter. If it moved to a steam-heated flat at \$30 a month, would it increase its expenses for the year or not, and how much?

9. The value of the men's factory products in the leading centers of the United States was as follows:

	1860	1900
New York.....	\$17,011,370	\$103,220,201
Baltimore.....	3,124,342	17,290,825
Boston.....	4,567,749	8,601,431
Chicago.....	540,709	36,094,310
Philadelphia.....	9,962,800	18,802,637

Find the increase or decrease in the value of the men's factory products in 1900 as compared with that of 1860.

10. Two boys made a gallon of lemonade, using 16 lemons at 30 cents a doz. and 2 lbs. of sugar at 6 cents a pound. They sold it at 5 cents a glass, 6 glasses to a quart. How much was each boy's share of the gain?

TABLE II  
DISTRIBUTION OF CORRECT ANSWERS BY QUESTIONS AND BY GRADES  
ARITHMETIC. JUNE TEST

PROBLEM NUMBERS	SEVENTH GRADE				EIGHTH GRADE				TOTAL	
	FIRST HALF		SECOND HALF		FIRST HALF		SECOND HALF			
	No. of Partici- pants	No. Correct	No. of Partici- pants	No. Correct	No. of Partici- pants	No. Correct	No. of Partici- pants	No. Correct	No. of Partici- pants	No. Correct
1.....	1,505	313	1,478	358	1,163	354	1,104	515	5,250	1,540
2.....	1,442	152	1,454	189	1,091	167	1,166	277	5,153	785
3.....	1,442	796	1,454	933	1,091	750	1,166	922	5,153	3,401
4.....	1,508	988	1,544	1,164	1,129	881	1,192	991	5,373	4,024
5.....	1,442	978	1,499	1,192	1,091	931	1,134	1,046	5,166	4,147
6.....	1,508	452	1,544	653	1,129	515	1,192	696	5,373	2,316
7.....	1,526	778	1,754	1,108	1,257	898	1,261	988	5,798	3,772
8.....	1,442	556	1,454	783	1,091	593	1,124	801	5,111	2,733
9.....	1,594	481	1,604	616	1,214	572	1,248	785	5,660	2,454
10.....	1,442	519	1,454	724	1,091	514	1,124	774	5,111	2,531

The ten problems used in the June test are the following, their numbers corresponding to the numbers in the table above:

1. A farmer has a herd of 12 dairy cows that average 22 pounds each of milk per day. The milk contains 3.8 per cent butter-fat, and butter-fat is worth 28 cents per pound. What is the daily income from the herd?

2. I am making a handkerchief out of a piece of linen 10 $\frac{3}{4}$  in. square. If I make a  $\frac{1}{4}$ -in. hem all around it, how long and wide will it be when finished?

3. If Texas is 213.06 times as large as Rhode Island, and New York is 39.44 times as large as Rhode Island, then Texas is how many times as large as New York? Express to the nearest second decimal place.

4. According to the report of the Bureau of Census the numbers of persons engaged in the different groups of occupations in the United States in 1880 and 1910 were as follows:

Group	1880	1910
1.....	7,713,875	12,567,925
2.....	1,871,503	7,605,730
3.....	3,784,726	10,807,521
4.....	603,202	1,825,127
5.....	3,418,793	5,361,033

Find the total increase in the number of persons employed in the United States in 1910 over those employed in 1880.

5. A can of milk containing 40 quarts costs \$1.60. What percentage is gained by selling the milk for 6 cents a quart?

6. I bought a cask of molasses containing 84 gallons for \$28. Nine gallons having leaked out, at what price per gallon must I sell the remainder to gain \$4.25?

7. A farmer's wife bought 2.75 yards of table linen at \$0.87 a yard and 16 yards of flannel at \$0.55 a yard. She paid in butter at \$0.27 a pound. How many pounds of butter was she obliged to give?

8. A man and boy together spaded  $\frac{9}{10}$  of a garden. If the man spaded twice as much as the boy, what part of the garden did each spade?

9. A contractor completed  $\frac{2}{3}$  of a job in  $12\frac{1}{2}$  days. How much longer should it take to finish the job?

10. In a certain state the cost of building a macadam road is shared by the town, county, and state. The state pays  $\frac{1}{6}$ , the county  $\frac{1}{6}$ , and the town the remainder. If the state pays \$1,200, what does the town pay?

On the basis of the preliminary testing, the first problem in the March test was supposed to be of equal difficulty with the first problem in the June test; the second problems in both tests were, likewise, supposed to be equal in difficulty; and similarly for the remaining problems. This equality has no particular interest in the present report, and the equality is obscured by the fact that the June test was given at the very end of the school year.

Tables III and IV are based upon Tables I and II, respectively, and show, for each problem and for each grade, the percentages of pupils who obtained correct answers. They also show, as a better expression of the difficulty of the problems, and, consequently, of the ability required for their solution, the equivalents of the percentages, in terms of that unit of variability of the curve of error known as the "Probable Error." It is, of course, a well-known fact that there is an illusion in percentage ratings, due to the fact that the distribution of ability does not take rectangular form, but, rather, that of a logarithmic curve of approximately "normal" type. Account of this distribution is taken when

TABLE III

PERCENTAGES OF CORRECT ANSWERS FOR EACH PROBLEM AND FOR EACH  
GRADE, WITH P.E. EQUIVALENTS  
ARITHMETIC. MARCH TEST

PROBLEM NUMBERS	SEVENTH GRADE				EIGHTH GRADE				TOTAL	
	FIRST HALF		SECOND HALF		FIRST HALF		SECOND HALF		Per- centage Correct	P.E. from Median
	Per- centage Correct	P.E. from Median	Per- centage Correct	P.E. from Median	Per- centage Correct	P.E. from Median	Per- centage Correct	P.E. from Median		
1...	9.4	+1.95	11.2	+1.80	23.8	+1.06	39.9	+0.38	19.8	+1.26
2...	23.7	+1.06	31.0	+0.74	45.2	+0.18	61.7	-0.44	39.0	+0.41
3...	44.7	+0.20	54.9	-0.18	66.7	-0.64	76.4	-1.07	59.4	-0.35
4...	34.9	+0.58	42.8	+0.27	53.4	-0.13	72.5	-0.89	49.5	+0.02
5...	35.6	+0.55	49.0	+0.04	56.8	-0.25	70.2	-0.79	51.8	-0.07
6...	26.7	+0.92	35.4	+0.56	44.1	+0.22	54.3	-0.16	39.0	+0.41
7...	51.2	-0.04	62.5	-0.47	72.5	-0.89	78.9	-1.19	65.1	-0.58
8...	33.8	+0.62	43.3	+0.25	51.7	-0.06	69.1	-0.74	48.1	+0.07
9...	47.1	+0.11	51.9	-0.07	62.0	-0.45	65.8	-0.60	55.5	-0.21
10...	39.8	+0.38	50.1	-0.00	55.3	-0.20	72.8	-0.90	53.3	-0.12

TABLE IV

PERCENTAGES OF CORRECT ANSWERS FOR EACH PROBLEM AND FOR EACH  
GRADE, WITH P.E. EQUIVALENTS  
ARITHMETIC. JUNE TEST

PROBLEM NUMBERS	SEVENTH GRADE				EIGHTH GRADE				TOTAL	
	FIRST HALF		SECOND HALF		FIRST HALF		SECOND HALF		Per- centage Correct	P.E. from Median
	Per- centage Correct	P.E. from Median	Per- centage Correct	P.E. from Median	Per- centage Correct	P.E. from Median	Per- centage Correct	P.E. from Median		
1...	20.8	+1.21	24.2	+1.04	30.4	+0.76	46.6	+0.13	29.3	+0.81
2...	10.5	+1.86	13.0	+1.67	16.6	+1.44	23.8	+1.06	15.2	+1.52
3...	55.2	-0.19	64.2	-0.54	68.7	-0.72	79.1	-1.20	66.0	-0.61
4...	65.5	-0.59	75.4	-1.02	78.0	-1.15	83.1	-1.42	74.9	-1.00
5...	67.8	-0.69	79.5	-1.22	85.3	-1.56	92.2	-2.10	80.3	-1.26
6...	30.0	+0.78	42.3	+0.29	45.6	+0.16	58.4	-0.32	43.1	+0.26
7...	51.0	-0.04	63.2	-0.50	71.4	-0.84	78.4	-1.17	65.6	-0.60
8...	38.6	+0.43	53.9	-0.15	54.4	-0.16	71.3	-0.83	53.5	-0.13
9...	30.2	+0.77	38.4	+0.44	47.1	+0.11	62.9	-0.49	43.4	+0.25
10...	36.0	+0.53	49.8	+0.01	41.1	+0.33	68.9	-0.73	49.1	+0.03



percentage values are thus converted into some unit of variability of the curve of error.<sup>1</sup>

The twenty problems listed in Tables I-IV, as has been stated, were given in March and in June, 1915, to typical schools in New York City. On the basis of the returns received from these schools, the figures given in Tables V and VI were made up. These figures refer to the scores of individuals. As measures of the ability of groups of children, these tables may prove useful. They are, however, only approximations.

TABLE V

DISTRIBUTION OF PUPILS ACCORDING TO THE NUMBER OF PROBLEMS ANSWERED CORRECTLY

ARITHMETIC. MARCH TEST

No. OF PROBLEMS CORRECT	GRADE VII <sup>1</sup>		GRADE VII <sup>2</sup>		GRADE VIII <sup>1</sup>		GRADE VIII <sup>2</sup>		GRADES VII <sup>1</sup> TO VIII <sup>2</sup>	
	No.	Percent-age	No.	Percent-age	No.	Percent-age	No.	Percent-age	No.	Percent-age
0.....	190	13.2	144	8.1	43	3.9	6	0.6	353	7.1
1.....	230	16.0	157	11.1	73	6.7	18	1.7	478	9.6
2.....	160	11.1	147	10.4	88	8.1	42	4.0	437	8.8
3.....	204	14.1	154	10.9	96	8.8	51	4.9	505	10.1
4.....	161	11.2	178	12.6	112	10.3	67	6.4	518	10.4
5.....	156	10.8	147	10.4	132	12.1	115	11.0	550	11.0
6.....	114	7.9	150	10.6	131	12.0	117	11.3	512	10.3
7.....	98	6.8	126	8.9	136	12.5	160	15.4	520	10.4
8.....	77	5.3	121	8.6	125	11.5	163	15.6	486	9.8
9.....	43	3.0	107	7.6	96	8.8	189	18.1	435	8.7
10.....	9	0.6	9	0.6	59	5.4	114	10.9	191	3.8
Total ....	1,442	.....	1,410	.....	1,091	.....	1,042	.....	4,985	.....
Median...	2.691	.....	4.747	.....	6.015	.....	7.656	.....	5.367	.....

The fact that the ten problems upon which each of these tables is based varied widely in point of difficulty makes conclusions as to individual abilities somewhat unreliable. Tables made up from material each part of which was of equal difficulty would be more reliable, but no such tables have ever been constructed, for the reason that no material meeting these conditions exists. Meanwhile, therefore, we shall be obliged to content ourselves with the usual method of approximation. With this caution

<sup>1</sup>For conversion tables see E. L. Thorndike, *Mental and Social Measurements*, 2d ed., p. 228; also B. R. Buckingham, *Spelling Ability, Its Measurement and Distribution*, p. 116.

in mind, Tables V and VI may be used as standards of attainment. Figs. 1-8 show, in graphic form, the frequencies of each rating as given in these tables.

TABLE VI

DISTRIBUTION OF PUPILS ACCORDING TO THE NUMBER OF PROBLEMS  
ANSWERED CORRECTLY  
ARITHMETIC. JUNE TEST

No. OF PROBLEMS CORRECT	GRADE VII <sup>1</sup>		GRADE VII <sup>2</sup>		GRADE VIII <sup>1</sup>		GRADE VIII <sup>2</sup>		GRADES VII <sup>1</sup> TO VIII <sup>2</sup>	
	No.	Per- centage	No.	Per- centage	No.	Per- centage	No.	Per- centage	No.	Per- centage
0.....	67	4.6	28	2.0	13	1.2	4	0.4	112	2.2
1.....	144	10.0	65	4.6	32	2.9	4	0.4	245	4.9
2.....	193	13.4	95	6.7	71	6.5	27	2.6	386	7.7
3.....	235	16.3	165	11.7	111	10.2	62	6.0	573	11.5
4.....	211	14.6	200	14.2	171	15.7	73	7.0	655	13.1
5.....	204	14.1	243	17.2	167	15.3	116	11.1	730	14.6
6.....	143	9.9	204	14.5	146	13.4	145	13.9	638	12.8
7.....	97	6.7	189	13.4	142	13.0	184	17.7	612	12.3
8.....	70	4.9	134	9.5	129	11.8	159	15.3	492	9.9
9.....	54	3.7	69	4.9	79	7.2	189	18.1	391	7.8
10.....	24	1.7	18	1.3	30	2.7	79	7.6	151	3.0
Total.....	1,442	.....	1,410	.....	1,091	.....	1,042	.....	4,985	.....
Median....	4.389	.....	5.626	.....	5.886	.....	7.489	.....	5.715	.....

Fig. 9 shows, for each grade, in the form of a scale, the facts with respect to the difficulty of the problems that were shown in the columns headed "P.E. from Median" in Tables III and IV, although the problems of the June test are not strictly comparable to those of the March test, on the basis of the returns received, for the reason that there is an increment of ability among school children during a three months' period. The two sets of problems are scaled on the same projection, but they are kept separate by showing, in Fig. 9, the numbers of the March problems above the scale line, and the numbers of the June problems below the scale line.

Fig. 9 also shows a general scale for the four grades combined; the point of reference is the median of Grade VII<sup>1</sup>. In order thus to refer the results of the testing in higher grades to the median of the lowest grade, it is necessary to know the intervals between the medians of the successive grades.

Tables VII and VIII show, for the March and June tests, the number of pupils in each grade who equaled or exceeded the score of the median

TABLE VII  
AMOUNT AND PERCENTAGE OF OVERLAPPING WITH P.E. EQUIVALENTS  
ARITHMETIC. MARCH TEST

		Grade VII <sup>1</sup>	Grade VII <sup>2</sup>	Grade VIII <sup>1</sup>	Grade VIII <sup>2</sup>
Grade VII <sup>1</sup> .....	No.	.....	538	340	163
	Per cent	.....	37.3	25.3	11.3
	P.E.	.....	+0.48	+0.99	+1.80
Grade VII <sup>2</sup> .....	No.	1038	.....	511	281
	Per cent	73.6	.....	36.2	19.9
	P.E.	-0.94	.....	+0.52	+1.25
Grade VIII <sup>1</sup> .....	No.	915	708	.....	327
	Per cent	83.9	64.9	.....	30.0
	P.E.	-1.47	-0.57	.....	+0.78
Grade VIII <sup>2</sup> .....	No.	989	875	742	.....
	Per cent	95.0	84.0	71.2	.....
	P.E.	-2.44	-1.48	-0.83	.....

Table reads: 538 pupils of Grade VII<sup>1</sup> equaled or exceeded the score of the median pupil of grade VII<sup>2</sup>, which was 37.3 per cent of all pupils of Grade VII<sup>1</sup>. The equivalent of this percentage is 0.48 P.E., etc.

TABLE VIII  
AMOUNT AND PERCENTAGE OF OVERLAPPING WITH P.E. EQUIVALENTS  
ARITHMETIC. JUNE TEST

		Grade VII <sup>1</sup>	Grade VII <sup>2</sup>	Grade VIII <sup>1</sup>	Grade VIII <sup>2</sup>
Grade VII <sup>1</sup> .....	No.	.....	465	412	198
	Per cent	.....	32.2	28.6	13.7
	P.E.	.....	+0.69	+0.84	+1.62
Grade VII <sup>2</sup> .....	No.	980	.....	642	318
	Per cent	69.5	.....	45.5	22.6
	P.E.	-0.76	.....	+0.17	+1.12
Grade VIII <sup>1</sup> .....	No.	789	589	.....	311
	Per cent	73.1	54.0	.....	28.5
	P.E.	-0.91	-0.15	.....	+0.84
Grade VIII <sup>2</sup> .....	No.	917	800	770	.....
	Per cent	88.1	76.8	73.9	.....
	P.E.	-1.75	-1.09	-0.95	.....

Table reads: 465 pupils of Grade VII<sup>1</sup> equaled or exceeded the score of the median pupil of Grade VII<sup>2</sup>, which was 32.2 per cent of all pupils of Grade VII<sup>1</sup>. The equivalent of this percentage is 0.69 P.E., etc.

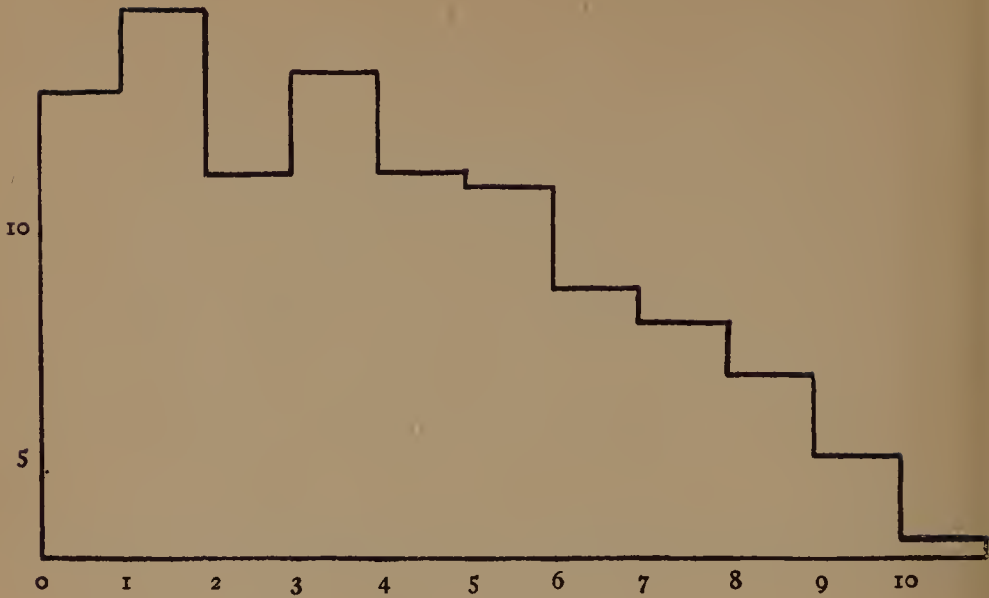


FIG. 1

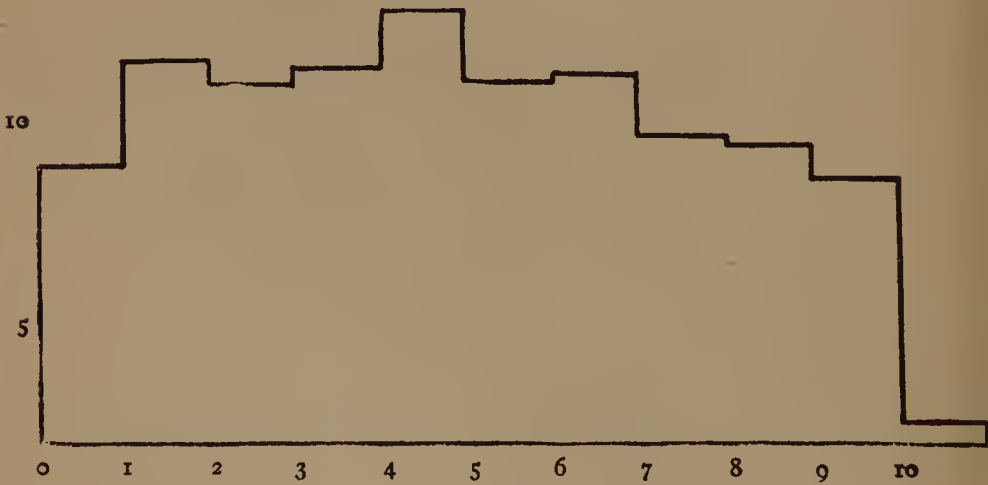


FIG. 2

FIGS. 1, 2, 3, AND 4.—Frequency of each rating (of problems correct) in Grades for problems answered correctly. The vertical scale is for the percentage of children Grade 7<sup>2</sup>; 1,091 for Grade 8<sup>1</sup>; and 1,042 for Grade 8<sup>2</sup>.

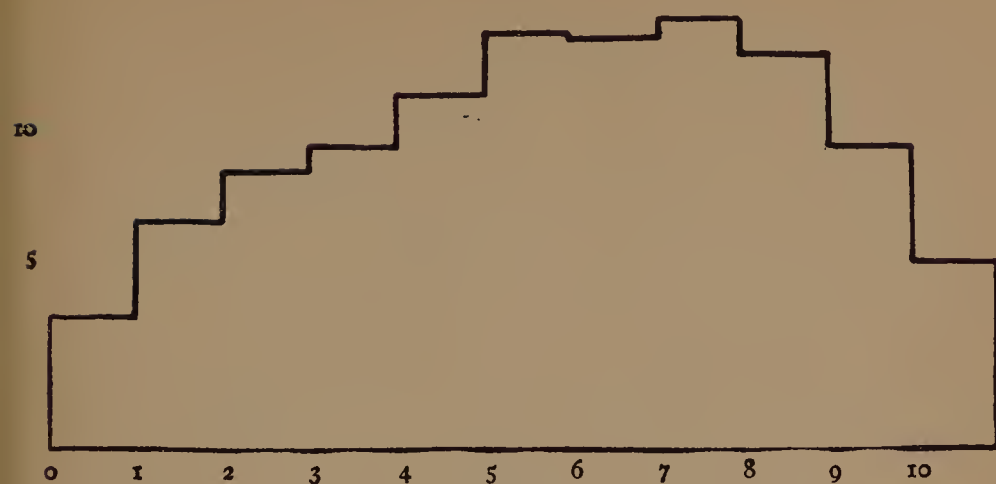


FIG. 3

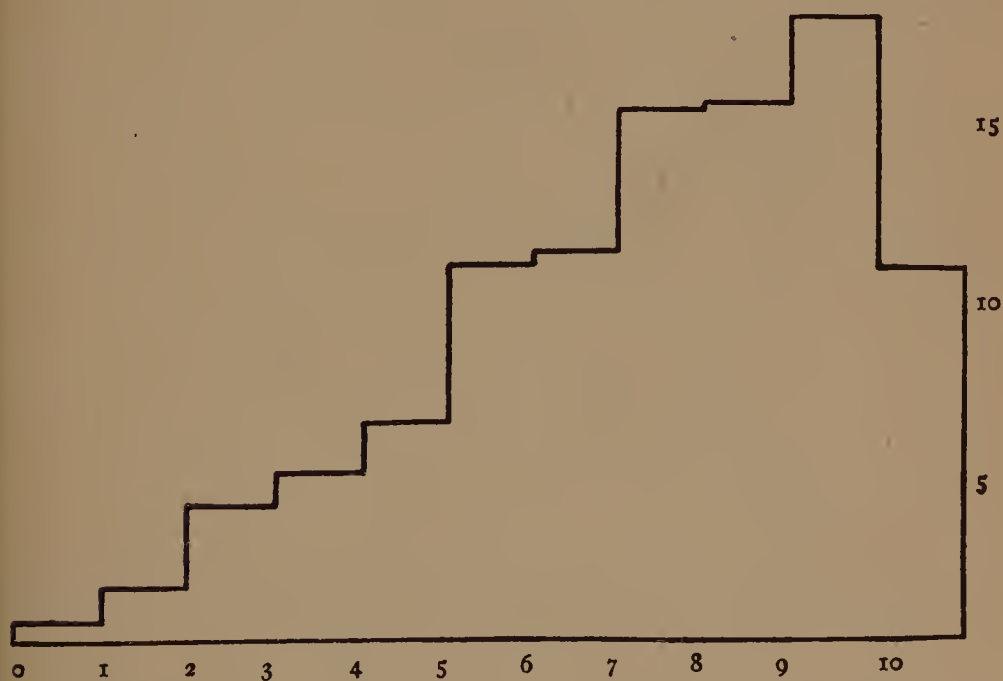


FIG. 4

7<sup>1</sup>, 7<sup>2</sup>, 8<sup>1</sup>, and 8<sup>2</sup>, respectively. March test. (See Table V.) The horizontal scale is who obtained each correct number of answers.  $N=1,442$  for Grade 7<sup>1</sup>; 1,410 for



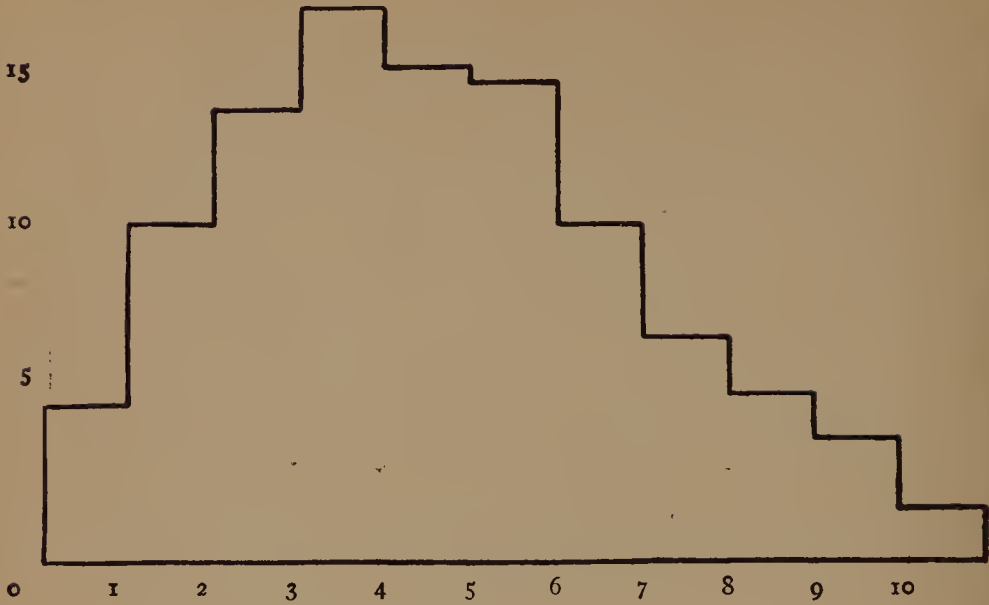


FIG. 5

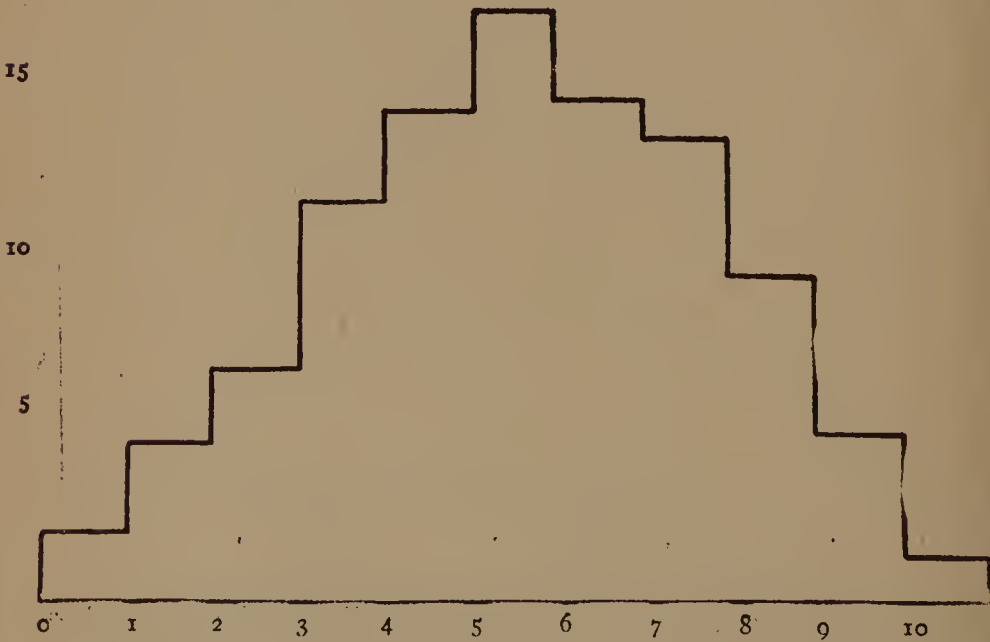


FIG. 6

FIGS. 5, 6, 7, AND 8.—Frequency of each rating (of problems correct) in Grades for problems answered correctly. The vertical scale is for the percentage of children Grade 7<sup>2</sup>; 1,091 for Grade 8<sup>1</sup>; and 1,042 for Grade 8<sup>2</sup>.

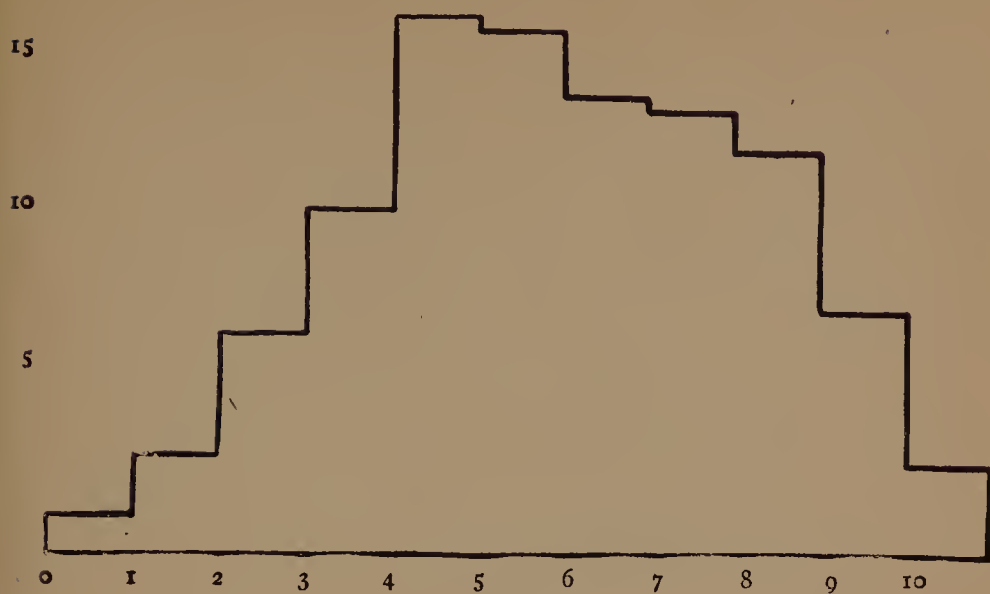


FIG 7

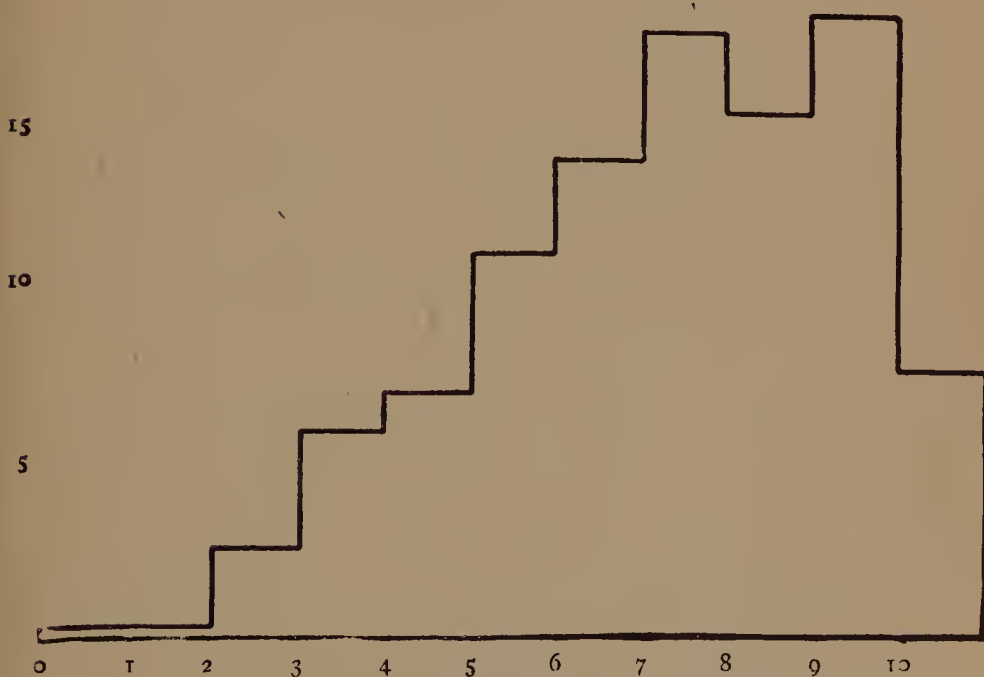


FIG. 8

$7^1$ ,  $7^2$ ,  $8^1$ , and  $8^2$ , respectively. June test. (See Table VI.) The horizontal scale is who obtained each correct number of answers.  $N=1,442$  for Grade  $7^1$ ; 1,410 for

pupil of each of the other grades. They also show the percentages and P.E. values corresponding to these numbers. The P.E. values are the intervals between the grade medians. These tables are constructed upon the assumption of a normal distribution of ability in all grades, and upon the further assumption that the variability in any one grade is equal to the variability in each of the other grades.

Obviously, we have several expressions for the same relationship; for instance, in Table VIII, the distance between the median of Grade VII<sup>1</sup> and the median of Grade VII<sup>2</sup> is (column 4) 0.69. In the same table, the same distance measured in the opposite direction is 0.76. Two similar values for the same distance are shown in Table VII; and besides these four measures, a number of others may be derived. Using, however, only direct statements of the relationship between consecutive medians, we have, in each case, four quantities. The averages of these, being taken, give the following results:

Median of Grade VII <sup>1</sup>	to median of Grade VII <sup>2</sup>	= 0.72 P.E.
" " " VII <sup>2</sup>	" " " " VIII <sup>1</sup>	= 0.37 P.E.
" " " VIII <sup>1</sup>	" " " " VIII <sup>2</sup>	= 0.85 P.E.

To obtain the general scale shown in Fig. 9, all that is necessary to do now is to add to the P.E. values of Tables III and IV, for grades higher than VII<sup>1</sup>, the interval at which the medians of these grades stand above the median of Grade VII<sup>1</sup>. By so doing, three values in addition to the one for Grade VII<sup>1</sup> will be found, and the average of these four may be taken as the best position at which to "place" the problem in question.

Table IX gives the distance at which each problem stands above the median of Grade VII<sup>1</sup> when computed on the basis just described. The general scale in Fig. 9 is the graphic representation of this table.

It is clear that the scales derived in this paper are very meager, and, as was said in the beginning, this report is merely preliminary and suggestive. A far greater number of problems in arithmetic should be used for the purpose of constructing a more complete scale. In fact, 120 such problems are now being worked up with this end in view. Material is likewise in hand for a large number of questions in geography, history, and grammar, which will be scaled in the same way.

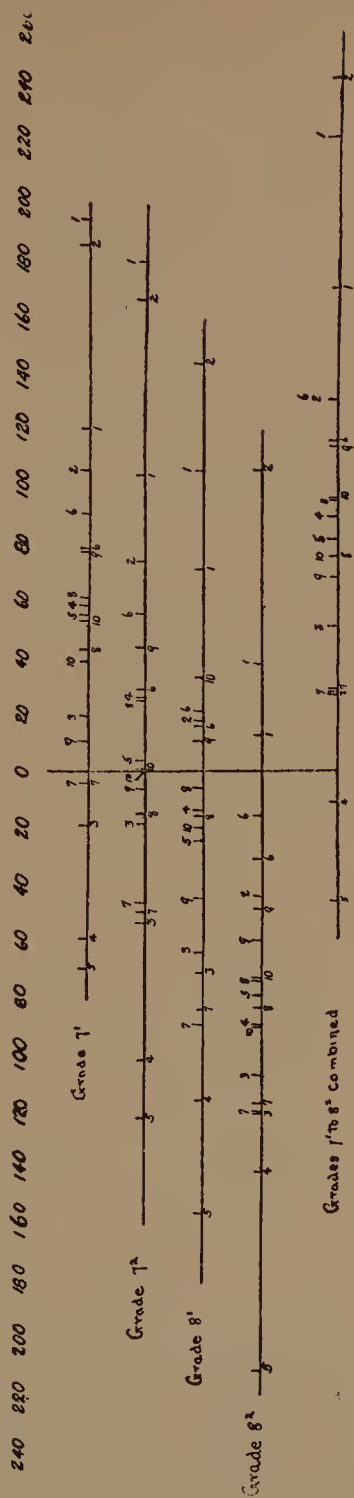


FIG. 9

FIG. 9.—Grade and General Scales. Figures above the scale lines refer to the March Test, those below the scale lines to the June Test.

Any superintendents or principals who are willing to give tests in these subjects are invited to communicate with the writer of this chapter.

TABLE IX

AVERAGE POSITION OF PROBLEMS, EXPRESSED AS DISTANCES FROM THE MEDIAN OF GRADE VII AND IN UNITS OF P.E.

Problem	March	June
1.....	2.24	1.72
2.....	1.32	2.45
3.....	0.52	0.28
4.....	0.90	-0.11
5.....	0.83	-0.46
6.....	1.32	1.17
7.....	0.29	0.30
8.....	0.96	0.76
9.....	0.69	1.15
10.....	0.76	0.97



### CHAPTER III

#### SCORE CARD FOR CITY SCHOOL BUILDINGS

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The score card which is printed herewith has been developed as a part of the advanced work in educational administration under the direction of the author of this article, with five different groups of graduate students, through two academic years and one summer session.<sup>1</sup> The idea of a score card has been common over a considerable period of years, especially in the work of agricultural colleges. There is a manifest advantage in the score card in that it fixes attention upon all of those qualities or elements which go to make up the perfect whole desired. Individuals in judging school buildings not infrequently think mainly in terms of two or three elements which seem to them to be of primary importance, and often neglect other parts of the building which are, when one stops to consider them, of equal value. In making the score card, it has been necessary first of all to include as nearly as possible all those details which go to make up the perfect school building. It was, of course, desirable, in so far as it was possible, to include under a few main heads all the subordinate factors. It was only after a very considerable amount of experimentation that the heads "Site," "Building," "Service Systems," "Classrooms," and "Special Rooms" were decided upon.

After organizing the score card in terms of the large and the subordinate heads, the next step was, of course, to assign to each main and each subordinate head the proper weight out of a total of a thousand points which was allowed as a perfect score. The method employed was

<sup>1</sup> Special acknowledgment is due to Messrs. L. H. King, B. W. Loomis, and A. Dushkin, who were constituted as the first committee to draft a score card for school buildings, and whose work was used as a basis for discussion in the subsequent development of the form which is here printed. The author is indebted to Dr. M. R. Trabue for the statistical calculations necessary to determine the weights to be assigned to each of the several items.

to ask experienced superintendents and principals of schools taking work in educational administration, which involved a considerable knowledge of statistics, to assign to each element the weight which they thought should be attached. The five large heads were scored first, next the several main subdivisions under each large head, and finally the elements under the last-named divisions. More than two hundred students participated in this part of the work. From the ratings assigned by the last group of a hundred students working upon the score card, after studying the results which had already been secured by the former groups, medians were calculated, first, for the large heads, and then for each of the subordinate heads. The medians were calculated only to the nearest five points on the scale. This means that the score card as it appears represents the combined judgment of the scorers to within two and one-half points. In many cases, of course, the median fell on five or some multiple of five, in which case the score given corresponds exactly to the median found.

The method employed in determining the weight to be assigned to each element appearing on the score card needs no particular defense, since the value of any particular part or element in the construction of the building is, after all, a matter of judgment. The median judgment derived from the scores allowed by a large group of those competent to judge of the worth of the several elements is the best single measure which can be found.

In order to use the score card, one should be familiar with the problems involved in schoolhouse construction. To that end, there appears at the end of the score card a bibliography. It would be well, in training people to use the score card, to have them thoroughly conversant especially with the more important authorities on the subject of school hygiene and school architecture. After such study, visits to buildings, under the guidance of some competent student of these problems, would add greatly in training persons to use the card. The card is given first in a very brief and highly condensed form, which could be used only by those entirely familiar with the longer form and with the meaning of each of the headings which is there listed. As a matter of practice, it will be best first to use the longer form of the score card, and, only, after considerable facility has been acquired, to drop the longer form in favor of the shorter summary. For one familiar with school buildings and with the score card, much would be gained by checking over blueprints

and specifications in the light of the score card before beginning to construct the building. Here again the value is in large measure to be found in the fact that each of the more important items will be brought to the attention of the one who seeks to criticize the plans and specifications, and their relative importance will at least in some measure be indicated.

It will be found particularly worth while to score old buildings, in order to call attention to the necessity for reconstruction which is always to be found in a city in which buildings have been in use over a considerable number of years. As one studies the problem of school buildings in the United States, he is impressed by the accidental or occasional repair or reconstruction which is provided. A careful study and scoring of these buildings will often indicate common deficiencies of very great importance which should receive immediate attention, and others which are of relatively less significance which may be postponed for a time. In the same school system it may be found as well that one building is so remarkably more deficient than another that it is manifestly good public policy to spend whatever money is available in reconstructing the buildings which scores lowest before undertaking the work which may not be nearly as important in other buildings.

In the case of scoring school buildings, as with any other instrument of measurement, the result should suggest problems, and in some measure indicate the direction in which reforms are to be brought about. Any person using the score card should supplement the mere scoring of the several items with a report upon any notable deficiency which renders the building unfit for use. It is entirely conceivable that a building on most counts might stand high, but in some one particular, say with respect to fire protection or sanitation, might rate as entirely unsatisfactory. In this case the notation, after the building was scored, would call attention to the fact that measures should be taken immediately to remedy particular defects, in which case the building would, possibly with a minimum of expense, be brought up to a very high standard of excellency.

The writer will be very glad to receive, from anyone who may use the score card, criticisms or suggestions for its improvement. It will be particularly helpful to receive reports of the use of the score card, showing to what degree two or more individuals scoring the same building arrive at the same result.

# SCORE CARD FOR SCHOOL BUILDINGS AND EQUIPMENT FOR CITY ELEMENTARY AND HIGH SCHOOLS

City.....	Building.....
Principal.....	Date.....
Enrolment: Boys..... Girls.....	Total.....
Average Daily Attendance: Boys..... Girls.....	Total.....
Number of Rooms.....	Approximate Cost.....
Scorer.....	

## INSTRUCTIONS

1. Abbreviation: S—standard.
2. Basis for scoring—1,000 points.
3. In scoring classrooms, stairways, entrances, fire escapes, and the like, score each separately and insert the average for the final score.
4. It will be worth while to use this card in checking up blueprints of prospective buildings. To do this will require a complete set of specifications with the blueprints, also a copy of state laws and city ordinances.

## SHORT FORM OF SCORE CARD

I. SITE.....	(125)
A. Location.....	(55)
1. Accessibility (25)    2. Environment (30)	
B. Drainage.....	(30)
1. Elevation (20)    2. Nature of Soil (10)	
C. Size and Form.....	(40)
II. BUILDING.....	(165)
A. Location.....	(25)
1. Orientation (15)    2. Position on Site (10)	
B. External Structure.....	(60)
1. Type (5)    2. Material (10)    3. Height (5)	
4. Roof (5)    5. Entrances (10)	
6. Aesthetic Balance (10)    7. Condition (15)	
C. Internal Structure.....	(80)
1. Stairways (35)    2. Corridors (25)    3. Basement (15)	
4. Attic (5)	
III. SERVICE SYSTEMS.....	(280)
A. Heating and Ventilation System.....	(70)
1. Kind (20)    2. Installation (10)    3. Air Supply (25)	
4. Distribution (15)	
B. Fire Protection System.....	(65)
1. Apparatus (10)    2. Fireproofness (20)    3. Escapes (20)	
4. Electric Wiring (5)    5. Fire Doors (10)	

C. Cleaning System.....	(20)
D. Artificial Lighting System.....	(20)
E. Electric Service Systems.....	(15)
1. Clock (5)                  2. Bell (5)                  3. Telephone (5)	
F. Water Supply System.....	(30)
G. Toilet System.....	(50)
1. Distribution (10)      2. Fixtures (10)      3. Adequacy (10)	
4. Seclusion (5)          5. Sanitation (15)	
H. Mechanical Service Systems.....	(10)
1. Elevators (5)          2. Book-Lifts (2)      3. Waste-Chutes (3)	
IV. CLASSROOMS.....	(290)
A. Location and Connections.....	(35)
B. Construction and Finish.....	(90)
1. Size (25)              2. Shape (15)              3. Floors (10)	
4. Walls (10)            5. Doors (5)              6. Closets (5)	
7. Blackboards (10)    8. Color-Scheme (10)	
C. Illumination.....	(85)
1. Glass Area (45)      2. Windows (30)      3. Shades (10)	
D. Cloakrooms and Wardrobes.....	(25)
E. Equipment.....	(55)
1. Seats and Desks (40)      2. Teacher's Desk (10)	
3. Bulletin Boards (5)	
V. SPECIAL ROOMS.....	(140)
A. Large Rooms for General Use.....	(65)
1. Playroom (10)    2. Auditorium (15)    3. Study-Hall (5)	
4. Library (10)      5. Gymnasium (15)    6. Lunchroom (10)	
B. Rooms for School Officials.....	(35)
1. Offices (10)      2. Teachers' Room (10)    3. Nurses' Room (10)	
4. Janitor's Room (5)	
C. Other Special-Service Rooms.....	(40)
1. Laboratories (20)    2. Lecture-Rooms (10)    3. Storerooms (5)	
4. Studios (5)	

## DETAILED SCORE CARD FOR CITY SCHOOL BUILDINGS

## I. SITE

## A. Location:

1. Accessibility—centrality (present and future), car lines, streets.
2. Environment:
  - a) Physical—gardens, trees, shrubbery, buildings, hills.  
(S—Skyline should not have an angle of more than 30 degrees from base of building.)
  - b) Social—density of settlement, composition, moral influences.
  - c) Protection—freedom from noise, dust, danger, malodors.



**B. Drainage:**

1. Elevation, slope. (S—Grounds should slope away from building and should not exceed 1 in. for every 3 ft.)
2. Nature of soil—residual or artificial, kind, texture, aeration, hydration, surface material.

**C. Size and Form:**

Should be large enough and of good shape to allow for proper placing of buildings, for 30 sq. ft. of playground per child, and for school garden.

## II. BUILDING

**A. Location:**

1. Orientation—light, exposure. (S—Southeast, east, southwest, west, and south in order.)
2. Position on site as regards appearance and economy of playgrounds.

**B. External Structure:**

1. Type—rectangle, square, inner court, T, H, E, U.
2. Material. (S—Brick or stone.)
3. Height—number of stories. (S—Two stories above basement.)
4. Roof—type and material. (S—Flat, waterproof, suitable for playground, proper slope for drainage.)
5. Entrances:
  - a) Number, location width. (S—At least two, near stair landings, 11-13 ft. wide.)
  - b) Steps—number, protection from the elements. (S—As few as possible, unexposed.)
  - c) Vestibules—size, lighting. (S—11-13 ft. wide, double-swing glass doors, and waterproof floors.)
  - d) Doors—kind, opening, springs, checks, stops. (S—3½ ft. × 8 ft., opening outward with panic bolts.)
6. Aesthetic balance. (S—Simplicity and utility.)
7. Condition. (S—Should be in good repair.)

**C. Internal Structure:**

1. Stairways.
  - a) Construction—kind (box, open, winding), material, tread and riser, nosing, width, landing, banister (number, kind, size, stability), soundproofness. (S—Tread, 11-13 in.; riser, 7 in.; width, 5 ft.; metal banister, 1½ in. dia., at least two for each stairway, firmly attached.)
  - b) Number and location—proximity to exits. (S—At least two, landings near exits.)
  - c) Lighting—natural and artificial. (S—Should be well lighted.)
  - d) Sanitation—coves, corners, ledges. (S—Should have sanitary coves and be free from dust-catchers.)

2. Corridors.
  - a) Location.
  - b) Construction—material, width, door arrangement, finish (chair rail, picture mold, dado). (S—Width 11-13 ft.)
  - c) Obstructions—lockers, cases, pedestals. (S—These should not obstruct easy passage.)
3. Basement.
  - a) Depth below grade, dampness, areas. (S—Depth, 3 ft.; floor and walls waterproof.)
  - b) Boiler-room, accessibility to fuel-room, exits, ash-lifts.
  - c) Fuel-room, size, construction, chute.
4. Attic, waterproof, heatproof, floor.

### III. SERVICE SYSTEMS

NOTE.—Defects in any service system should be checked against the system, wherever found.

#### A. *Heating and Ventilating System:*

1. Kind of system—direct, direct-indirect, gravity, plenum, plenum-exhaust.
2. Installation—piping, workmanship, noise, control. (S—All piping should be insulated.)
3. Air supply—source, amount, humidification, ducts. (S—From the top of the building; humidity 40-60 per cent; 2,000 cu. ft. per hour per pupil, should not enter with a velocity greater than 6 ft. per second.)
4. Distribution—size, arrangement, kind of ducts, pipes, and radiators. (S—Single ducts for each room; inlets 8-9 ft. above floor, outlets near floor.)

#### B. *Fire Protection System:*

1. Apparatus—fire hose, extinguishers, water pressure, fire alarms. (S—Adequate supply on each floor; fire alarms easily accessible, automatic in boiler-room, connected with city fire department.)
2. Fireproofness:
  - a) Building as a whole—rating of underwriters.
  - b) Stairways. (S—Encased fireproof stair-wells.)
  - c) Boiler- and fuel-rooms. (S—Separate fireproof rooms.)
3. Fire escapes—number, location, kind, protection, number of exits. (S—In non-fireproof buildings there should be at least two fire escapes.)
4. Electrical work—nature and place of intake, insulation, number and kind of outlets, location of switches, meter, cut-out, cabinets. (S—Should be installed according to rules of underwriters.)
5. Fire doors—kind, location, operation. (S—Automatically closing.)

#### C. *Cleaning System:* Kind, installation, efficiency. (S—Vacuum system.)

#### D. *Artificial Lighting System:* Kind, amount, distribution, number, and location of switches, outlets for lanterns, etc.

E. *Electric Service Systems:*

1. Clocks.
2. Bells and gongs.
3. Telephones—number and location. (S—At least one on each floor.)

F. *Water Supply System:* Drinking-fountains, baths, lavatories, janitor's supply (on each floor). Installation and sanitation.G. *Toilet System:*

1. Distribution—location, accessibility. (S—Most on first floor, others distributed.)
2. Fixtures—seats, urinals, washbowls, sinks, towel and paper holders—size, kind, durability, and arrangement.
3. Adequacy—number. (S—1 seat for each 15 girls, 1 seat for each 25 boys, 1 urinal stall for each 10 boys.)
4. Seclusion—soundproofness, doors.
5. Sanitation—finish, material, workmanship, lighting, ventilating. (S—Material—not absorbent, non-corrosive.)

H. *Mechanical Service Systems:*

1. Elevators (for buildings of more than four stories)—location, fireproofness, adequacy.
2. Book-lifts.
3. Waste-chutes—kind, location, size. (S—Fireproof, outlets closing automatically.)

## IV. CLASSROOMS

A. *Location and Connections* (to exit, drinking-fountains, toilet). Deduct for base-rooms and those above fourth floor without elevators.B. *Construction and Finish:*

1. Size. (S—Per pupil 15 sq. ft. floor space and 200 cu. ft. air space.)
2. Shape—classroom 24×30×12 ft.
3. Floors—material, condition (cracks, checks, splinters, loose boards, projecting ends), width of boards, soundproofness, cove, baseboard, surface, finish. Stone, tile, cement, and other composition floors are bad for class- or study-rooms. (S—Should be battleship-linoleum, or hard wood, durable, well joined, and not dust-retaining.)
4. Walls, ceiling—plastering, finish, texture, condition, picture mold, chair rail, kind and condition of dado. (S—Hard, smooth, non-glass plaster, with cement plaster for dado, avoiding grooves and ledges.)
5. Doors—how opened, size, kind, lock, threshold, transom, number of exits. (S—Doors without thresholds and transoms.)
6. Closets and bookcases—location, size, convenience.
7. Blackboards—kind, length, width, color, chalk rail, height from floor, surface, quality, condition, trim. (S—Slate, full black, on front and side of room, 36-42 in. wide, height of chalk rail, grades I-II, 24 in.; III-IV, 26 in.; V-VI, 28 in.; VII-VIII, 30 in.; high school, 32-36 in.)

8. Color-scheme—woodwork, dado, walls, ceiling, furniture, shades, finish, fixtures. (S—Neutral color, buff or green; dado slightly darker than walls, white or cream ceiling; woodwork, furniture, and shades to harmonize in tone; dull, smooth finish.)

*C. Illumination:*

1. Glass area— $\frac{1}{5}$  to  $\frac{1}{4}$  area of floor.
2. Windows—size of mullions, nearness to ceiling, height of sill, kind of glass, distance of front window from front wall, orientation, shape. (S—From pupils' left, unilateral, grouped, symmetrical, as near ceiling as possible,  $3\frac{1}{8}$  to 4 ft. from floor, plain glass, mullions not over 12 in. wide. Front windows should not come within 5 ft. of front wall; easterly exposure best; rectangular in shape.)
3. Shades—kind, material, hanging, adjustment, condition. (S—Adjustable from center.)

- D. Cloakroom, Wardrobes:* Location, size, convenience, ventilation, finish. (S—Ample ventilation and accommodation.)

*E. Equipment:*

1. Seats and desks—kind, number. (S—Adjustable-movable or adjustable; not over 42 in number.)
2. Teacher's desk. (S—No platform.)
3. Bulletin boards.

V. SPECIAL ROOMS

*A. Large Room for General Use:*

1. Playroom—location, size, accessibility, adaptability, finish. (S—Per pupil 15 sq. ft. floor space and 200 cu. ft. of air space.)
2. Auditorium:
  - a) Location, accessibility. (S—Should be on first floor.)
  - b) Construction—size, height, seating capacity, floor, acoustics, exits, obstructions, gallery (kind, seating capacity, location), light and nature of stage, finish, ornamentation. (S—For 80 ft. length on flat floor, stage should be 3 ft. 8 in. high; on dish floor, 3 ft.)
  - c) Auxiliaries—dressing-rooms, curtain, setting, seats (kind, arrangement).
3. Study-hall—location, size, accessibility (especially to library), adaptability, finish.
4. Library—location, size, accessibility, form and arrangement of stacks.
5. Gymnasium:
  - a) Location—accessibility, segregation of sexes.
  - b) Construction—size, floor, track, gallery, soundproofness, finish. (S—Height 22–25 ft. Length and width should relate as 3 to 2.)
  - c) Auxiliaries—lockers, showers, dressing-rooms (number, kind, location, convenience, condition.)
6. Lunchroom—location, accessibility, size, adaptability, arrangement, finish, sanitation.

B. *Rooms for School Officials:*

1. Offices—location, size, adaptability, finish; waiting-room (ditto).
2. Teachers' room—location, size, toilet facilities, equipment, finish. (S—Equipped with chairs, couch, gas or electric plate.)
3. Nurses' room—location, size, equipment and toilet facilities (including bath) adaptability, sanitation, finish.
4. Janitor's room—location, size, convenience.

C. *Other Special-Service Rooms:*

## 1. Laboratories:

NOTE.—Include all facilities for chemistry, physics, biology, physiography, commercial work, household and industrial arts.

- a) Kind, location, size, adaptability. (S—Depends on number of pupils to be accommodated. A room 30×40 ft. will accommodate 25 pupils.)
- b) Construction—plumbing, storerooms, cabinets, finish.
2. Lecture-room—location, size, seating capacity, plumbing facilities, accessibility, fixed furniture (number, kind, arrangement).
3. Supply- and storerooms—location, size, adaptability.
4. Studios—kind, location, size, and adaptability.

NOTE.—Include drawing-, art-, and music-rooms.

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## CHAPTER IV

### COMPLETION TESTS FOR PUBLIC-SCHOOL USE

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Many of the tests upon which psychologists depend for their knowledge of an individual's mental characteristics are of such a nature that it is almost impossible to make extended use of them in the schoolroom. There are other very reliable psychological tests, however, which may be adapted to schoolroom use with comparatively few changes. One of these is the completion test, which psychologists have come to regard as an unusually good test of ability to think about words and language forms. In view of the fact that so much of the child's school work is dependent upon his ability to read and interpret printed words, it has seemed worth while to the writer to make such changes in the form of the completion test as will make it available for general use in schools.<sup>1</sup>

The scale shown below will serve as an example of the proposed new completion-test forms. It is believed that these new forms will be found very helpful to school officers in measuring the abilities of children and in classifying them accordingly.

The foregoing form is designed to meet the two or three most serious obstacles which heretofore have confronted the school officer who wished to employ the completion test in his school system. In the first place, the forms commonly used by the psychologists cannot be employed in the middle and lower grades of the elementary school because they are too difficult. Ebbinghaus, who was the first to employ the completion-test method, used mutilated paragraphs. In this respect he has been followed very closely by later investigators, and in almost every instance the incomplete paragraphs have been too difficult for practical use with elementary school pupils. I have attempted, in preparing forms for school children, to use the sentence, rather than the paragraph,

<sup>1</sup> M. R. Trabue, "Completion-Test Language Scales," *Teachers College Contributions to Education*, No. 77, New York, 1915.

as the unit of thought. I have found it possible to begin a test with sentences so simple that a large majority of the second-grade pupils are able to complete them correctly, and to finish the test with sentences so difficult that only a small percentage of the Freshmen in college complete them.

Write only one word on each blank

Time Limit: Seven minutes

Name.....

### TRABUE LANGUAGE SCALE B

1. We like good boys ..... girls.
6. The ..... is barking at the cat.
8. The stars and the ..... will shine tonight.
22. Time ..... often more valuable ..... money.
23. The poor baby ..... as if it were ..... sick.
31. She ..... if she will.
35. Brothers and sisters ..... always ..... to help  
..... other and should ..... quarrel.
38. .... weather usually ..... a good effect  
..... one's spirits.
48. It is very annoying to ..... tooth-ache,  
..... often comes at the most ..... time imaginable.
54. To ..... friends is always ..... the ..... it  
takes.

A second difficulty with previous completion-test forms arises from the fact that we do not know the relative values of the various commonly used paragraphs, which makes it practically impossible to measure progress from year to year or from grade to grade. Professor Whipple emphasizes this point, as follows: "Since the elision of a single letter may, in some circumstances, very considerably increase the difficulty of the test, it follows that, without extensive preliminary trials, it is well-nigh impossible to prepare a series of texts of equivalent difficulty, or to insure that the several sections within a given text present equivalent difficulty."<sup>1</sup>

This objection has been met by actually trying the incomplete sentences upon thousands of public-school children and discovering from the results just how difficult each sentence is for each class of children, and for all children together. From the results thus obtained,

<sup>1</sup> G. M. Whipple, *Manual of Mental and Physical Tests*, Part II (1915), p. 284.

four approximately equal\* scales have been derived (Scale B, shown above, being one of the four), each scale consisting of ten sentences, which are arranged in the order of their difficulty from simple to hard. By measuring ability at the beginning of a year with one scale and then at the beginning of the next year with an equivalent scale, it is possible by subtracting the first result from the second to determine the amount of change effected in a class or in a child during a year.

A third difficulty with the paragraph form of the completion test is found in the scoring. Ebbinghaus scored according to the number of syllables correctly supplied, but this method is inadequate, for some syllables are ten times as hard to supply as others. Later investigators have estimated the quality of the completed paragraphs as wholes, giving 100 per cent for a perfectly completed paragraph, 50 per cent "if the inserted words make a well-connected story, but related in only a moderate degree to the thought that should have been given," and no credit at all for words which are "purely literary invention, having no connection with the thought given by the printed words."

It will readily be seen that very careful consideration and judgment are required if one is to assign accurate and comparable scores in the foregoing manner. Even trained psychologists have difficulty in agreeing just how much a given completion is worth. Teachers and school administrators are usually too busy with other school problems to spend much time in such tiresome mental labor as is required to assign scores to partially completed paragraphs.

After making an attempt to distinguish six grades of quality (5-4-3-2-1-0) in the completion of a sentence,<sup>1</sup> the writer found that practically nothing was lost by simplifying the scoring still further, giving 2 points credit for each perfectly completed sentence, 1 point for each sentence completed with only a slight imperfection, and 0 for any sentence omitted or imperfectly completed. It is infinitely easier and quicker to say that a sentence is "right," or that it is almost "right," than it is to decide that a partially completed paragraph is worth 78 per cent of a perfectly completed paragraph. The writer has also published in the appendix of his report the detailed scheme by which each individual sentence was scored, in order that teachers or administrators who do not wish to be

<sup>1</sup> J. L. Stenquist, E. L. Thorndike, and M. R. Trabue, "The Intellectual Status of Children Who Are Public Charges," *Archives of Psychology*, No. 33, September, 1915, pp. 13-19.

bothered with the making of judgments as to whether a sentence is right or wrong may have before them very objectively just what has been called "right" and what has been called "wrong."

The writer is rather firmly convinced that ability to perform mental tasks can be measured more adequately by a graded series of performances to be done in a given time than by any other scheme. The measurement of physical ability to lift weights at arm's length may be taken as an analogy. If we had a series of ten weights, ranging from 20 to 200 pounds by steps of 20 pounds between consecutive weights, as represented in Fig. 1, we might measure a boy's ability by having him begin at the lightest of the series and at arm's length lift in their order to the level of his shoulder as many of the weights as possible. In order to make the analogy with Scale B complete, we should have to give 2



FIG. 1.—Representing a series of graduated weights.

points credit for each weight lifted to a level with his shoulders, and 1 point for each weight which was lifted "almost but not quite" to the shoulder level within a time-limit of seven minutes.

With the older completion-test forms the analogous measurement would be as follows: give the individual the 200-pound weight and see how nearly to the shoulder level he can raise it in ten minutes. It is clear at once that a test arranged on such a plan could be used for only a short fraction of the total range of ability, and that scores assigned by different individuals for the same quality of performance would vary considerably.

With certain commonly used tests in arithmetic the analogous measurement would be somewhat as follows: give the boy a large number of 100-pound weights and see how many of them he can at arm's length lift to shoulder level in four minutes. It is evident at once that a large amount of ability must be present before such a test can begin to measure, and that speed is practically the only element of ability measured. Since speed is desirable, however, it is highly worth while to measure it, although we must be careful not to take a measurement of speed as a sufficient index of ability.



In arranging the language scales, the writer has assumed that older children will not only be able to do the same tasks more rapidly and more perfectly than younger children, but that the older children will also be able to accomplish perfectly tasks which the younger children could not begin to do. The results from twelve or thirteen thousand children, upon whom these sentences have been tried, seem to support this assumption in every respect.

The unit of difficulty used in constructing Language Scales B, C, D, and E is the P.E., or median deviation from the median of a school-grade distribution of ability, assuming the curve of distribution for ability in any given grade to be "normal" in shape and equivalent in range to the range of any other grade distribution. The reasons for making these assumptions and using this measure of the variability of a

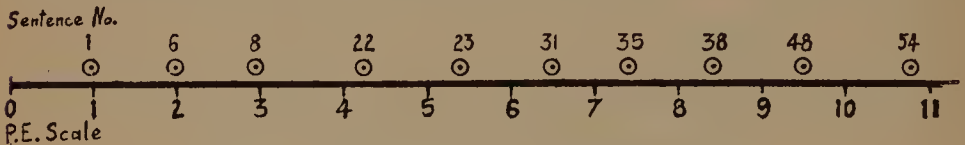


FIG. 2.—Linear projection of Language Scale B.

grade as the unit need not be discussed here. It is worth while to remember, however, that if we take any two groups, selected by the same or by equally capable judges as representing two different degrees of the same sort of ability, these two groups are very likely to be distributed "normally" in each case and the variability of one group will probably be very nearly equal to the variability of the other. In other words, approximately as many errors of judgment are made in selecting one group as in selecting the other, and in each group approximately as many are overestimated as are underestimated, errors in either direction being much more frequently small than large. In brief, the P.E. is a convenient unit which has approximately the same value in every grade and may therefore be used to measure the distance between grades and the difficulty of tests for all grades.

On a P.E. scale above an arbitrary zero point, the location of each sentence of Language Scale B is as represented in Fig. 2. It will be observed that the intervals between sentences are not exactly 1 P.E. in each case, but for practical purposes they are near enough. The improvement made by a person who was at first able to complete only two sentences but is now able to complete four is at least in a very real sense

equal to the improvement made by the person who was at first able to complete only seven sentences but is now able to complete nine.

As yet the writer has not had time to use the new scales very extensively in their present form, although the sentences of which they are composed have been thoroughly tested in other combinations of sentences. Language Scale A,<sup>1</sup> which is so poorly graded as not to be worthy of the name "scale," has nevertheless revealed some of the possible values of the completion test in school procedure.

Scale A was composed of 24 sentences, so that with 2 points credit for each perfectly completed sentence the maximum score possible would be 48 points. The median score and the range of the middle 50 per cent of the scores are shown in Table I for those pupils of the elementary grades who were tested with Scale A.

TABLE I  
SCORES OF ELEMENTARY-GRADE PUPILS ON LANGUAGE SCALE A

	SCHOOL GRADE						
	II	III	IV	V	VI	VII	VIII
No. tested.....	1318	1437	1463	1507	1454	1456	1427
Median score....	4.59	8.99	14.33	18.39	21.92	25.27	28.06
25 percentile....	2.40	6.22	10.28	14.97	18.14	21.58	24.34
75 percentile....	6.57	13.04	18.60	22.02	25.36	29.08	32.42

In connection with Table I it is worth while to consider Table II, which shows the median scores of twelve-year-old boys according to the school grade in which they are found.

TABLE II  
MEDIAN SCORES OF TWELVE-YEAR-OLD BOYS ON LANGUAGE SCALE A

	SCHOOL GRADE					
	III	IV	V	VI	VII	VIII
No. tested.....	22	62	155	269	217	76
Median score.....	10.5	12.9	16.3	21.6	24.7	29.8

<sup>1</sup> M. R. Trabue, "Some Results of a Graded Series of Completion Tests," *School and Society* (April 10, 1915), 537-40.

It would seem from Tables I and II that the ability measured by these completion-test sentences is related rather closely to the ability which teachers consider when promoting pupils to higher grades. Table III, showing the median scores of sixth-grade boys according to their

TABLE III  
MEDIAN SCORES OF SIXTH-GRADE BOYS ON LANGUAGE SCALE A

	AGE						
	10	11	12	13	14	15	16
No. tested.....	70	201	243	164	74	30	7
Median score.....	23.4	22.6	21.9	21.1	18.9	17.6	13.3

ages, is interesting in this connection. This table furnishes evidence of a fact which needs to be emphasized. Teachers tend to retard the bright young chaps because they are "too young" and to promote the dull old fellows because they are "too old" for the grade. Possibly the most serious retardation problems in our American school systems arise from our lack of adequate provision for the exceptionally bright young children.

Scale A was given in a number of intermediate schools with interesting results. At Decatur, Illinois, four classes of Grade VIIA were tested. The median scores were as follows:

	CLASS			
	VIIA <sup>1</sup>	VIIA <sup>2</sup>	VIIA <sup>3</sup>	VIIA <sup>4</sup>
No. pupils....	23	22	20	21
Median.....	28.3	26.9	25.5	23.7

After this result was noticed, I was interested to find that each pupil is classified, on entering VIIA, according to the judgment of previous teachers as to his general ability to do school work, those of greatest ability being put in VIIA<sup>1</sup>, the next best group in VIIA<sup>2</sup>, and so on.

In Grand Rapids, Michigan, those pupils in the eighth grade whose superior scholarship has been proved are allowed to take up the study of Latin. The median score of the 28 pupils in the Latin group was 34.0, with only one score as low as 27, while the median score of the 71 other

pupils in the same grade of that school was 29.8, with two scores of 17. Evidently the ability required to make high scores on Language Scale A is rather closely related to the quality for which teachers look when they attempt to select their brightest pupils for special work.

In view of the fact that ability to complete incomplete sentences is so obviously dependent upon ability to read and interpret printed words, it is not surprising to find that home training and nationality show an appreciable correlation with ability in these language scales. Three graduating classes in the elementary schools of Kansas City were measured on Language Scale A, with the following results:

	SCHOOL		
	Hyde Park	Whittier	Hamilton
No. pupils.....	44	42	29
Median.....	33.4	31.3	27.3

The Hyde Park and Whittier schools are distinctly American, the first being in the best residence section of the city and the second being in a respectable middle-class district. The Hamilton School, however, is in a foreign district, one block from the Swope Settlement.

The writer found a similar situation in Bayonne, New Jersey. Three VIA classes were measured on Scale A, with the following results:

	SCHOOL		
	Mann	Vroom	Lincoln
No. pupils.....	32	37	39
Median.....	23.6	20.4	19.2

The Mann School is largely American, the Vroom largely Jewish, and the Lincoln largely Slavonic in student population.

The completion test is not proposed as a substitute for the judgment of teachers in promoting pupils, but rather as an aid to it. Employing one of these scales will call attention to those children who have unusual ability to understand and interpret printed words and phrases. These unusual cases may then be investigated more carefully and such readjustments made as will allow these children to work under the most favorable conditions.





## PART II

### APPLICATION OF SCALES AND UNITS OF MEASUREMENT IN EDUCATIONAL SUPERVISION AND ADMINISTRATION

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#### CHAPTER V

##### WORK OF THE DEPARTMENT OF EDUCATIONAL INVESTIGATION AND MEASUREMENT, BOSTON, MASSACHUSETTS

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The three phases of the work of the Department of Educational Investigation and Measurement, which will be described in order below, are: (A) measurement of educational results; (B) supervision of a revision of the elementary course of study; (C) the organization of a plan for the promotion of teachers on merit.

#### A. MEASUREMENT OF EDUCATIONAL RESULTS

I. *Arithmetic*.—The Courtis standard research tests in the four fundamentals were first given in Boston in October, 1912, by Mr. Courtis himself. Later they were given by others and have been continued to be given by this department. Their introduction into the Boston schools has been gradual, beginning with 21 districts in October, 1912, and covering the 70 elementary districts in May, 1915.

The tests have resulted as follows:

1. They have made possible the establishment of objective standards of achievement for Grades IV–VIII in addition, subtraction, multiplication, and division. These standards are based on the median score attained by large groups of pupils, and represent, therefore, the minimal achievement of at least 50 per cent of the children tested. These standards are shown in Table I.

2. These tests have shown the relative standing of each school, of each class, and of each pupil, in the 70 elementary school districts

tested, thereby providing the administrative officers with information as to the conditions which need improving.

3. They have revealed the ineffectiveness of the present general class drill in arithmetic on the four fundamentals, by showing that approximately one-third of the class gets more drill than it needs, another third makes fair progress, and the other third not only does not improve but, in many cases, actually loses in ability.

TABLE I

GRADES	TIME ALLOWED							
	Addition, 8 Minutes		Subtraction, 4 Minutes		Multiplication, 6 Minutes		Division, 8 Minutes	
	Attempts	Rights	Attempts	Rights	Attempts	Rights	Attempts	Rights
IV.....	8	6	8	6	6	4	4	2
V.....	9	7	9	7	7	5	6	4
VI.....	10	8	10	8	9	7	8	6
VII.....	11	9	11	9	10	8	10	8
VIII.....	12	11	12	11	11	10	12	11

4. They have demonstrated the need of drilling pupils in those four fundamentals in which they are deficient. To this end, a large number of the 70 elementary school districts have introduced several kinds of practice material in arithmetic, the relative merits of which are being studied by teachers and masters with a view to using that which proves most effective.

II. *Spelling*.—Proceeding from the fact that an eighth-grade pupil probably uses not more than twenty-five hundred words in his writing, whereas the spellers in common use contain from ten to fifteen thousand words, the department has worked as follows:

1. With the aid of many teachers minimal and supplementary lists of alleged difficult words have been prepared for each of the eight grades. These lists were placed in the hands of each teacher in the elementary schools, with the suggestion that the minimal list be emphasized in the spelling instruction (*School Document No. 8, 1914*).

2. The intention is by no means to limit the instruction to the words which are at present contained in the minimal list, but it is to make sure that the child learns to spell the words which he actually uses in his voluntary writing.

3. A test was given in May, 1915, to all grades above the second, for the purpose of determining the relative degree of difficulty of the words in the minimal lists.

4. As a result of that test each word is accompanied by a percentage, which indicates the number of pupils that spelled the word correctly. In this way each teacher is furnished with a list of alleged difficult words, together with information as to their relative degree of difficulty, thus making it possible for a teacher to place the emphasis in her instruction on the more difficult words (*School Document, No. 10, 1915*).

5. A further result of this test is to furnish each teacher with a standard by which she may judge whether her class is above or below the general standard for the city. If, for instance, a word is indicated as having been spelled correctly by 90 per cent of the children of the city, a teacher knows that if more than four out of the forty pupils in her class misspelled that word her class is below the standard ability of Boston children to spell that word.

6. A study has been made of the various lists of words that have recently been prepared as a result of scientific investigation, and the resulting list has been supplied to the teachers. It is the ultimate intention to make selections of words from this list to be added to the minimal lists until the minimal lists contain practically all of the words which are within the writing vocabularies of the normal pupils of each grade.

III. *English*.—Before the Department of Educational Investigation and Measurement was organized a Committee on Standards in English had been at work for some time and had set up some tentative requirements in English which the committee felt ought to be met by every pupil who graduates from the elementary schools. These requirements were approved by the Board of Superintendents and thus became authoritative standards. The requirements are as follows: Every graduate should be able:

1. To copy twelve lines of simple prose or poetry, and a bill of at least seven items. (Copying is not an end in itself, but a means to an end. The pupil should be made to see that accuracy in arithmetic, language, and other subjects may depend largely on accuracy in copying.)

2. To take down from dictation a passage of simple prose. (The purpose of dictation is to test language forms, punctuation, and spelling

already taught. It should never be used as a method of teaching. It should succeed and not precede a teaching lesson.)

3. To write from simple directions a friendly letter or an application for a position. (The letter is to be the pupil's own work, but he may be allowed to make corrections and to re-write. There should be no corrections by the teacher.)

4. To write within a half-hour a simple, original composition of not less than one page of letter paper, with every sentence grammatically complete. The pupil may make revisions, including interlinear corrections, but must not re-write.

In this composition the total number of serious errors in grammar, spelling, and punctuation should not exceed five—such errors, for example, as “I seen,” “we was,” “had wrote,” “he try” for “he tried,” “a women,” the use of “they” for “there,” “there” for “their,” “to” for “too”; the misspelling of such common words as “Wednesday,” “February,” “eighth,” “which,” “stopped,” “nineteen,” “minute,” “father,” “mother,” “English”; the omission of the period at the end of a sentence.

5. To recognize the parts of speech in their common uses; to explain the construction of words and phrases in a simple sentence containing not more than one phrase modifier in the subject and one phrase modifier in the predicate; to have a practical understanding of the uses to which the dependent clause of a complex sentence can be put—whether it be to serve as noun, adjective, or adverb; to know the principal parts of regular verbs and of the common irregular verbs, and their tense forms through the indicative mood.

6. To read at sight with readiness and good expression simple prose as difficult as *Little Men* or *Hans Brinker*.

7. To quote either orally or in writing fifty lines, not necessarily consecutive, of classic prose or poetry. (The pupil should look upon this not merely as something to be expected of him in the high school but also as a part of his equipment for life.)

8. To stand before the class and talk clearly on some subject of personal, school, or public interest.

The Committee on Standards in English is co-operating with the department in putting these requirements into effect. To this end, the department and the committee caused two tests to be given in

November, 1914, to 4,944 pupils in the first-year classes in the high schools. These tests were in accurate copying and in written memory work.

1. The test in accurate copying was to discover what degree of accuracy should be expected of pupils when they are asked to copy fifteen lines of prose in fifteen minutes.

2. The test in written memory work was to find out how well pupils remember the fifty lines of classic prose and poetry which the course of study requires that they shall have committed to memory before graduating from the elementary schools.

3. As a result of the test in accurate copying it has been found that boys will copy fifteen and one-half lines ( $4\frac{1}{2}$  inches long) of prose in fifteen minutes, with 50 per cent of the pupils making less than five errors of any kind (spelling, capitalization, punctuation, words omitted, words added, wrong words used, misspelled words, undotted *i*'s and uncrossed *t*'s).

4. The same test shows that the girls will copy more than sixteen lines in fifteen minutes, and that 50 per cent of the girls will make less than three errors of any kind.

5. By giving a standard test under controlled conditions, it will be possible to give a similar test at some future date and determine whether or not improvement has been made.

IV. *Geography*.—In co-operation with the head of the Department of Geography in the normal school the department has given two tests to pupils in the eighth grade to determine:

1. How well pupils in the eighth grade remember the geography which they were taught in the earlier grades.

2. What ability pupils have to reason about geographical data.

3. Whether mere place-geography is being overemphasized in teaching.

V. *Penmanship*.—The quality of the handwriting of elementary-school graduates has been studied as follows:

1. Six-hundred specimen papers were selected from the 4,944 papers written in the test in accurate copying. The pupils were not aware that their handwriting was to be examined, hence they probably wrote in a natural, unrestrained manner.

2. These 600 specimen papers were rated according to the Ayres Scale for Adult Handwriting, using only the specimens in the scale



under 90, 70, 50, and 30. Specimens poorer than the 30 specimen in the scale were rated 10.

3. The specimens were rated by a committee of six teachers who are superior teachers of handwriting. Each paper was rated by three persons.

4. The final rating of a paper was determined in the following manner: Where two or more persons agreed, that rating was given the specimen; where no two agreed, the middle rating was assigned.

5. A further study is being made of the merits and defects exhibited in these 600 specimens and a report will be printed and distributed among the teachers.

#### B. REVISION OF THE ELEMENTARY COURSE OF STUDY

In co-operation with two of the assistant superintendents the department is supervising the revision of the course of study in the elementary schools. In order to assist the teacher to economize her time and energy by the adoption of more definite purposes in teaching, these special features are being introduced into the course.

1. A concise, definite statement of the aims to be accomplished in the teaching of each subject in each grade.

2. A statement of the irreducible minimal essentials in each subject in each grade.

3. A definition of the objective standards of achievement in various subjects as far as they have been worked out.

This revision is being made with the co-operation of about 40 committees, including 359 different teachers, working on the following subjects: arithmetic, reading, stories and literature, spelling, grammar, composition, dictation, geography, and history.

This utilization of the knowledge, ability, and experience of the teachers will be followed by further professional educational advice from principals and superintendents. This method of course of study revision has the advantage of building up a practical course of study based on classroom experience, of securing the sympathetic understanding by the teacher of the course when it is adopted, and of affording helpful stimulus and proper encouragement to the teaching staff which must follow from such professional recognition.

## C. ORGANIZATION OF A PLAN FOR PROMOTION OF TEACHERS ON MERIT

Inasmuch as the higher positions in the school service must be filled by the superintendent when vacancies occur, the department has proceeded on the assumption that any plan of promotion, honestly administered, is better than no plan at all. The need of a systematic plan is seen in the following phases of the conditions in the Boston school system.

1. The size of the public-school system, with its nearly two thousand elementary and over five hundred high-school teachers, makes it impossible for the superintendent to know the work of the teachers except indirectly.

2. The variety of ranks both in the elementary and in the high schools makes relatively a large number of promotions within the service.

3. The large number of candidates who hold certificates making them eligible for promotion makes necessary some further plan for determining their relative professional qualifications.

The scope and method of the work of the department to formulate a plan will be illustrated by the following brief statements:

1. Several conferences have been held with sub-masters and master's assistants, because they are among those most interested in a plan of promotion on merit. Among other things, it was agreed, subject to the necessary official approval, that (*a*) the sub-master in the school where the vacancy occurs should be given first consideration for appointment; (*b*) other qualifications being equal, that sub-master in the service longest as sub-master should be appointed first; (*c*) ratings of teaching ability and estimates of probable future success should be secured from (i) assistant superintendents, (ii) masters of schools, (iii) director of promotion and educational measurement.

2. At a conference with the Board of Superintendents a common basis for securing discriminating and comparable ratings was agreed on.

3. A comprehensive basis for judging merit has been prepared by the department after a study of the available plans of rating teachers in cities throughout the country (see forms 264, 265, 266, and 267).

4. From April, 1914, when the department began work, to June 1, 1915, the following higher positions have been filled in accordance with the proposed plan, in so far as it has been worked out at the present

time. All appointments to higher positions between these dates have been made according to the merit system.

In elementary schools:

First assistant, grammar.....	Women.....	1
First assistant in charge.....	Women.....	7
Master's assistant.....	Women.....	5
Sub-master.....	Men .....	5
Master.....	{Men .....	5
	{Women.....	1

In high schools:

Master, head of department .....	Men .....	1
Head master .....	Men .....	4

## CHAPTER VI

### THE APPLICATION OF STANDARD MEASUREMENTS TO SCHOOL ADMINISTRATION

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A study of the educational literature of recent years reveals a steadily increasing interest in the possibility of the application of standard tests and measurements to the problems of school administration. Many prominent educators honestly question the value of such tests, because they feel that the most important elements in the mental and moral development of pupils are of an intangible character which can by no possibility be confined in terms of measurement. No one would dispute the fact that human life is a deeper and more complicated subject than can be probed by quantitative tests; nevertheless, when the more subtle components have been excluded, there remain some essential elements in education which are purely objective, and that these can be measured with reasonable exactness there is no reason to doubt. Because some things of supreme importance cannot be included in this category is no valid argument for rejecting the entire plan. We measure a man in terms of achievement; to apply to the schools the same test, the ability to produce results, is only logical and reasonable. The spiritual side of education is real and in all probability defies measurement, but a complete education includes elements other than the spiritual, and so far as they are present they can be measured. If they are so vague and indefinite as to escape measurement, their existence may well be doubted. The more clearly the objective results of education are understood, the greater the appreciation of the spiritual elements in the child's training. To reassure those who feel that any effort to arrive at a definite knowledge of educational values carries with it the danger of obtruding commercial methods into the region of things of the spirit, the well-proved truth may be reiterated here: the more clearly the objective results of education are understood the greater is the appreciation of the fact that unless all three natures, physical, mental, and spiritual, are being

definitely led toward their fulfilment, no system of child-training is even approaching the adequate performance of its function.

The mechanical application of standard tests with the resultant accumulation of medians, graphs, and charts is in itself a futile thing. Only as these tests are informed and controlled by a trained and sympathetic mind using the facts revealed as the basis of a constructive policy for future work do they find their justification. They show to a superintendent the extent to which his plans have been correctly interpreted and put into operation, and they furnish him with a sound basis for necessary changes, whether in the way of revision or of the introduction of new methods.

Because of the increasingly heavy demands upon the public schools, economy of time and of energy in every direction has become a necessity. Consider the relatively simple subject of penmanship. Once a pupil's handwriting was acceptable if the letters were well formed and the lines even, and the method of achieving this result was left largely to nature, or, when she had failed in the bestowal of the necessary gift, to the child's dogged patience in drawing over and over something resembling the copperplate sentence at the top of his writing-book. Now, writing has been differentiated from drawing, and every motion has been analyzed; unaccustomed muscles must be trained and co-ordination established; form must still be maintained, but the emphasis has been shifted to power; legibility must be accompanied by speed and a degree of freedom which makes it possible to continue the rapid, even movement for long stretches of time without fatigue. The problem before the school is how to meet these entirely reasonable demands without unduly prolonging the amount of time which may fairly be assigned to the subject. To this end the department of superintendence must know unmistakably every point of success or failure in the penmanship teaching and drill throughout the whole school system, that waste of time and effort may be eliminated. By what method shall the facts be ascertained most quickly and effectively?

Spelling is another comparatively simple subject, with a comparatively short time allotted to it in the school program. Questions like these face the teacher and the superintendent: Is the method in use producing accuracy? Is drill being wasted upon unusual words which will in all probability never find a permanent place in the child's vocabulary? Is drill on many words being carried beyond the point necessary



for fixing them in the memory? Has every child a limited working vocabulary which it is impossible for him to spell incorrectly?

Unsupported opinion can no longer be brought forward to decide, even in cumulative fashion, these and manifold other points which arise. What twenty eminent educators think as to the efficacy of a certain method gives way before the facts which careful investigation shows. Valid conclusions can be based only upon the results of accurate tests applied to large groups and continued for a sufficient length of time to eliminate possible error. If, as has already been said, such tests result only in the mere accumulation of educational statistics, they fail to justify the attendant expenditure of time and energy. They must surely function in an improvement in schoolroom practice or they are worse than useless. Unfortunately, it is precisely at this essential point that the vitality which should inform the laboriously acquired statistics is allowed to escape, leaving an inert mass of figures to show that someone has been busily and vaguely occupied about something. In education, as in every other department of life, the demand is not "Be busy about something," but "Be busy to some purpose."

So simple material as the relationship of "age and grade" should be carefully interpreted, and the inferences drawn from it should be a factor in shaping the school policies for the ensuing year. Percentage of promotion, "mortality" both in the grades and in the high school, the number of pupils accelerated or retarded, and other data of this character furnish evidence for a diagnosis of the health of the school body.

As a case in point may be cited the age-and-grade table of the Montclair, New Jersey, schools for September, 1912, which showed 23 per cent of retardation. Since this seemed too large for such a community, the superintendent and principals met for a discussion of plans looking toward the improvement of the situation. No radical steps were taken, but the schools were fully aroused to their responsibility for the excessive number of repeaters, with the result that the needs of individual children were given more careful consideration and a greater degree of flexibility was infused into school administration. In September of the following year figures were compiled on the same basis and the totals, which showed a decided improvement, formed the subject of another discussion. Four years of this policy have reduced the percentage of retardation almost 50 per cent.

23.3%



18.3%



14.8%



13.7%



1912

1913

1914

1915

CHART I.—Percentage of retardation in Montclair schools in successive years, showing steady reduction.

The same general plan for determining values can be applied to such questions as the wisdom of the establishment of open-window classes, which, it may be said in passing, should be distinguished from the open-air classes—a wholly different problem. The argument in favor of open-window classes seems faultless. Fresh air is essential to health; it has proved effective as a healing agent in cases of tuberculosis. Anaemic children are benefited by open-air rooms. The inference is that healthy children will show a still greater improvement, owing to their better physical status. The theory seems flawless, but we need to assure ourselves that the facts accord with the theory, and the only way to determine this is to test it. One test is to weigh the children of the open-window class at certain intervals and then compare the change in weights with the change in weights of an equal number of children who are in a classroom of the usual type. The chances are that a superintendent who has before him such a record as is shown in Chart II will hesitate before extending the plan to his entire school system. Especially will this be true if other tests of a different character point to the same conclusion.

In dealing with subnormal pupils the opinion generally prevails that they should be given a form of education in which the manual arts predominate. It is also believed that defective children who seem to learn readily and are able to recite fluently are doing it in parrot-like fashion and that even this seeming facility will not long persist, that it is simply a case of learning something today and forgetting it tomorrow. Obviously, it is of great importance to the teacher to know whether this assumption is true of the individual pupils in her care, or whether she may stress the academic phase of her work with some hope of making an enduring impression. Only by testing the individual pupils is she able to determine the character of the training suited to each.

The possibilities of the standard scale for such children are shown by the records in penmanship and arithmetic of a subnormal class last year. A local scale, based upon that of Dr. Thorndike, was used to measure the quality of the handwriting of all members of the class, and this formal rating was made once in two months. The arithmetic scale consisted of ten problems in fundamental operations. A definite time-limit was fixed for the solution of these problems. No credit was given for incorrect results or omitted examples. The records made by a subnormal pupil in the two subjects appear in Charts III and IV.

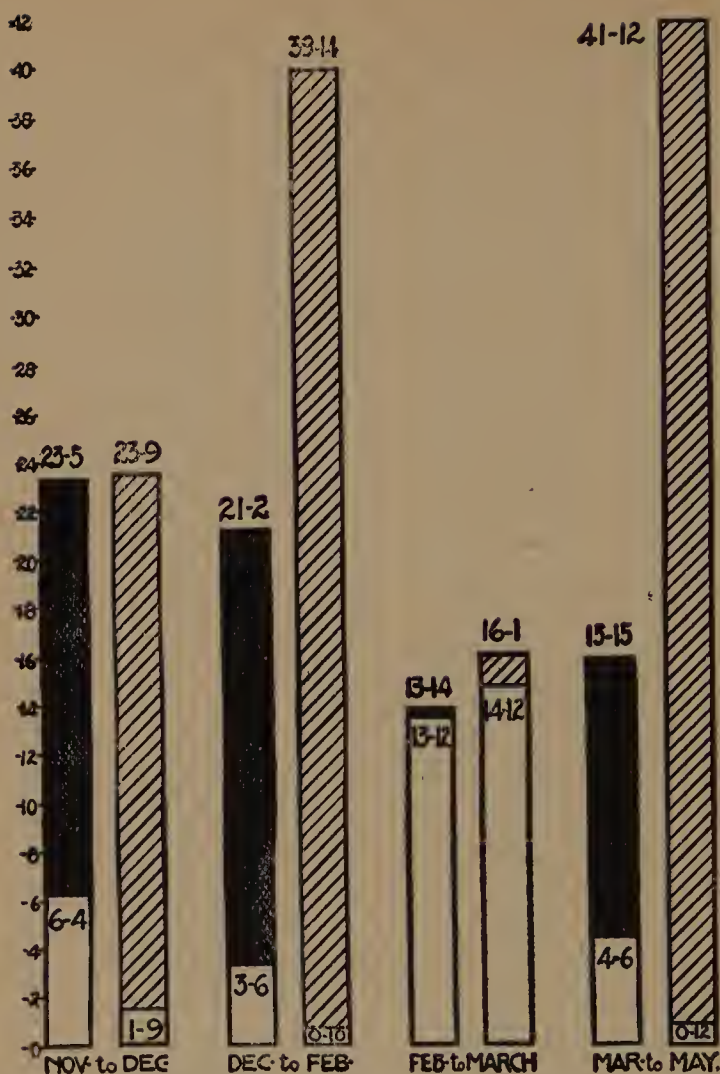


CHART II.—Gains and losses in weight of open-window class and of control class at Montclair, New Jersey. (The first column in each time group represents the open-window class, the second the control class. The entire height of the columns shows weight gain while the white portion records weight loss. Thus, from November to December the pupils of the open-window class gained 23 lbs. 5 oz. and lost 6 lbs. 4 oz., making a net gain of 17 lbs. 1 oz., which is shown by the blackening of the upper portion of the columns. During the same period the pupils of the control class gained 23 lbs. 9 oz., and lost 1 lb. 9 oz., leaving a net gain of 22 lbs. In every time group the control class showed a greater net gain than the open-window class.)



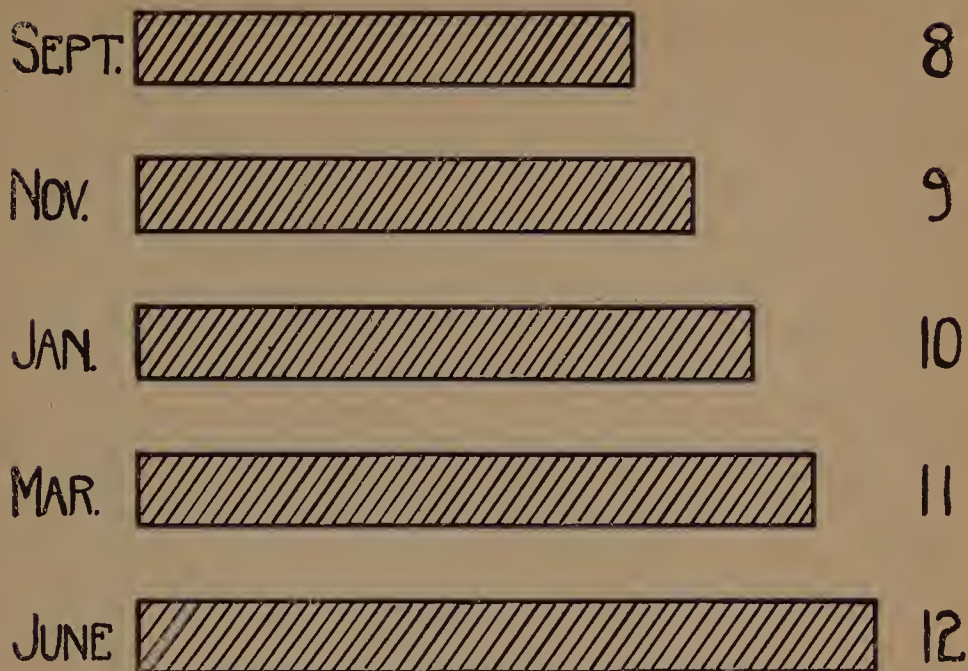


CHART III.—Performance in handwriting of a subnormal pupil. (The quality of the handwriting is indicated by the length of the hatched oblong and also by the digit at the right. The improvement is steady from September to June.)

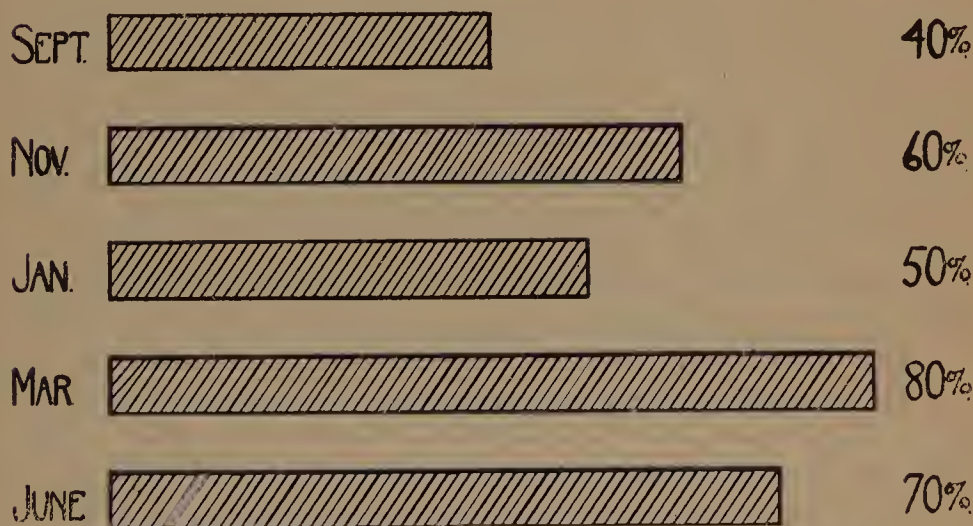


CHART IV.—Performance in arithmetic of a subnormal pupil. (The figure at the right shows the percentage of correct answers.)



In the purely mechanical process of writing there would seem to be no doubt that this pupil benefited directly from the teaching. In arithmetic the progress is not so evident.

The fact that the arithmetic test was confined to examples in fundamental operations of the same degree of difficulty made the tests practically uniform. It is very doubtful if a pupil whose record fluctuates to the extent indicated above receives any permanent value from such exercises. Similar charts made of every pupil in the class showed the same general tendency; improvement in penmanship was fairly constant, while in arithmetic frequent lapses appeared.

By the use of the standard scale the superintendent is enabled to check the results of any experiment in his schools and banish, from his own mind at least, any lingering doubts as to the wisdom or lack of wisdom of what he has undertaken. An experiment in one of the Montclair schools with a precocious class is a case in point. In September, 1912, in this school, a group of fourth-grade children of fairly uniform and

TABLE I  
RECORD OF TESTS

	Fractions	English	Spelling	Writing	Fundamen- tal Operations	Superin- tendent's Test Com- position
Watchung VIIA....	83.6	81	98	11.6	78	42.2
Watchung VIIB....	86.9	80	98	11.2	80	45.4
Grove VIIA.....	77	71	97	11.4	69	45.4
Special group.....	87	83	97	11.1	83	45.8

superior ability was put in charge of a strong teacher who was instructed to allow the class to advance as rapidly as it desired. No pressure was ever brought to bear upon the pupils, but dawdling was discouraged. The class remained with the same teacher for two years and in this time did three years of work. Four months after the special group entered the seventh grade, careful tests were made to determine to what extent the experiment had been a success or failure. A comparison of the record of the special seventh-grade pupils with that of the entire seventh grade with which they had been merged and with two other seventh grades of a similar type showed a very gratifying situation. Tests in spelling, arithmetic, and English were given by the principal and a

standard test in composition by the superintendent, while the penmanship was rated by the writing supervisor. A conclusion based upon the results obtained from these three separate and independent sources can fairly be presumed to represent the facts (Table I).

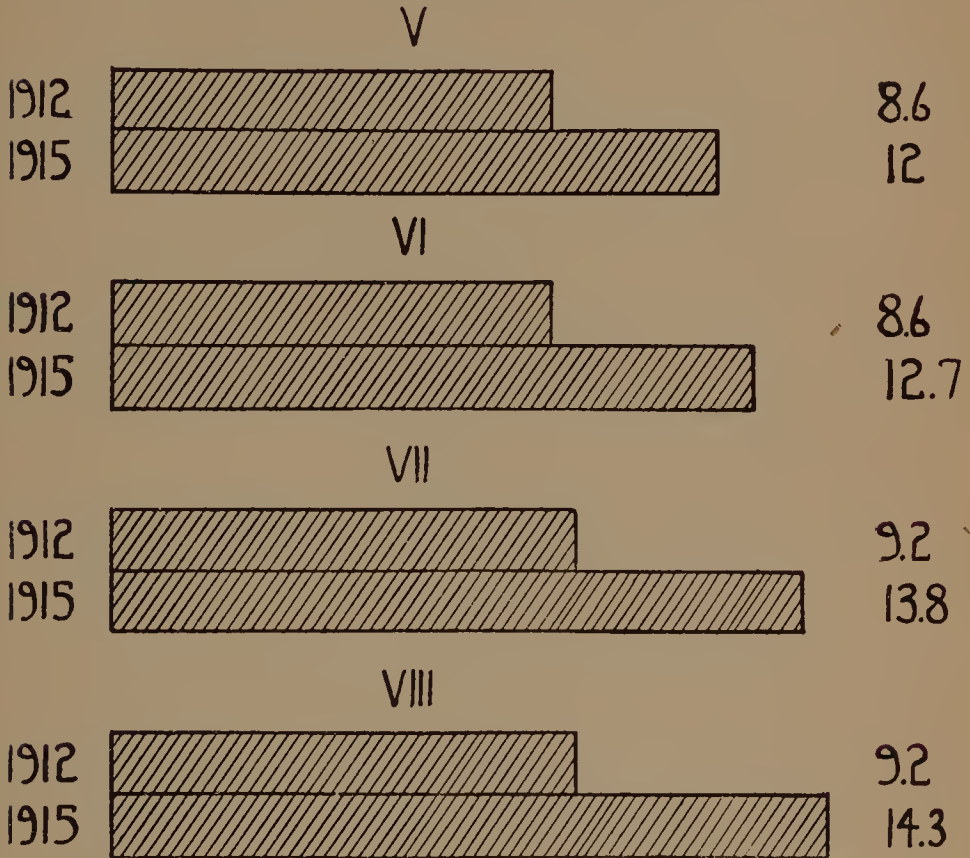


CHART V.—Improvement in penmanship in Grades V–VIII at Montclair, New Jersey, resulting from the use of a standard measuring scale. (The upper portion of each horizontal band represents the quality of the penmanship in the grade indicated in September, 1912. The lower portion shows the quality reached in June, 1915.)

It should be noted that the records in spelling, fundamental operations, complex fractions, and English show rank in percentage, while the penmanship rating and the superintendent's test are given in points and should be interpreted only as furnishing a basis for comparison.

That the children had not been advanced too rapidly is further indicated by the fact that all of them were regularly promoted at the

end of the year to the eighth grade, where they are now doing excellent work.

Standard tests are not only useful in bringing out the facts concerning pupils and classes, but are equally valuable in indicating general tendencies in the system as a whole. A recent school survey revealed the fact that in a certain system of schools the pupils in the fourth grade wrote practically as well as those in the fifth grade, while the hand writing of sixth-grade pupils was actually better than that of children in the seventh grade. Such a departure from a normal curve of advance may be justified by some unusual condition. However, the supervisory department should be fully aware of the facts if effective remedial measures are to be applied, and no amount of theorizing will furnish these facts. They can be obtained in only one way—by the application of one of the standard tests in penmanship. With the returns from such a test tabulated and charted, the situation in every grade is at least reasonably clear and a definite policy can then be formulated with some chance of reaching the root of the difficulty.

The effect of the use for three years of a standard penmanship scale upon the quality of the writing of public-school children is indicated in Chart V.

It is perhaps impossible to show by figures the total effect which tests of the type indicated here produce in the quality of the work of the schools. When purposeful effort is substituted for aimless drifting, there can be no permanent withholding of successful results. The only limits to investigation of this kind are those determined by the time which the supervisory department can afford to give to the work. It is based upon the fundamental idea of a continual local survey, made by those who know the actual school conditions, and who are seeking the facts as they exist, for the sole purpose of formulating constructive policies.

## CHAPTER VII

### A HALF-YEAR'S PROGRESS IN THE ACHIEVEMENT OF ONE SCHOOL SYSTEM

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#### SECTION A. THE PROGRESS AS MEASURED BY THE THORNDIKE VISUAL VOCABULARY TEST

The following report is based upon the responses of 754 pupils in the Bloomington, Indiana, schools to the Thorndike visual vocabulary test, which was given during the first week in February and again the first week in June, 1915. Only the papers of those pupils were considered who wrote both tests. The grades included are the IVB to the VIIIA inclusive.

The usual method of tabulating the results has not been followed, as the writer thinks that method not the best suited to show the actual achievement of any pupil; for example, the first two papers the writer took from a pile were each scored "line 7." In the first of these papers the pupil had made the correct response to every word in lines 4, 5, 6, and 7 and to one word of line 9. In the other paper correct responses had been made to every word in lines 4, 5, and 6, to four words of line 7, to two words each of lines 9 and  $10\frac{1}{2}$ , to three words each of lines 8 and 10, and to one word of line 11. While both these papers were scored as of equal value, the writer is convinced that the ability of the second pupil should be rated as nearly double that of the first. By the method of scoring used in this report, the first pupil receives a mark of 119 and the second a mark of 214.3.

Assuming that the line values of the scale are correctly assigned (the Indiana results indicate that radical revision is needed), and that each word within any line is approximately of the same value as any other word of that line, why not assign a definite score for each word depending upon the line it is in? Such a marking scheme will give a pupil

credit for what he actually accomplishes in the test, and will have the added advantage of stating the pupil or class ability in one numerical result which can be treated statistically with greater ease than in the Thorndike scheme.

The papers in this report have been graded on this basis: every correct response in line 4, four points; line 5, five points; line 6, six points, etc.—line eleven, 18.3 points. The sum of all the word points represents the total value of the paper.

For comparative purposes the score of any paper or class median can be reduced to line and word values of the scale thus: line 4 has a range of value from 0 to 20; line 5, 21-45; line 6, 46-75; line 7, 76-110; line 8, 111-150; line 9, 151-195; line 10, 196-245; line 10½, 246-297.5; and line 11, 298-352.5.

By this scheme the ability of a pupil or of a class may be stated in fractional parts of a line or in terms of the first, second, etc., words within a given line; e.g., a pupil whose score is 126 has an ability equal to that represented by line 7 and 16 points additional, which is four-tenths of line 8, or two words of this line.

Table I shows the results of the February and June tests. The features to which attention is called are: (1) the score of each grade in the February test, (2) the gain from grade to grade in the February test, (3) the gain of each grade from February to June.

From this table the median gain from grade to grade by the February test is 18.8, or, stated in other terms, this gain is the equivalent of three words of line 6 or of two words of line 9. The greatest difference, 38.5, is between Grades VIB and VIA; and the least, 6.7, is between Grades VIIB and VIIA. The median gains within each of the grades between the February and June tests is 17.3; the highest, 37.5, is in Grade VIB and the lowest, 3.9, in Grade VIIIA.

It will be noted that the curves of Chart I show no marked plateaus and that the achievement in the VIB grade is double that in the IVB, while the VIIIA median is three times that of the IVB. This seems to indicate a steady and normal vocabulary development.

As comparable tests were not available, the same tests were given in June as in February. Whether the gain during the term is due to the natural growth in vocabulary on the part of the pupils or to their having remembered some of the words from the February test and looked



them up afterward as a matter of curiosity, I cannot say. I think the latter is true in only a very few cases.

TABLE I  
THORNDIKE VISUAL VOCABULARY TEST (754 CASES)

Grade	No. of Pupils	Date	Score	P.E.	Line Value	February Difference between Grades	Gain during Term
IVB ....	91	Feb.	81.3	28.5	7.18	.....	11.2
		June	92.5	28.5	7.5		
IVA ....	85	Feb.	107.5	34.8	7.93	26.2	27.3
		June	134.8	35.6	8.62		
VB.....	65	Feb.	129.0	48.8	8.47	21.5	22.0
		June	151.0	41.6	9.02		
VA.....	102	Feb.	145.3	34.0	8.88	16.3	10.7
		June	156.0	30.4	9.13		
VIB ....	81	Feb.	164.1	43.0	9.31	18.8	37.5
		June	201.6	43.5	10.12		
VIA ....	83	Feb.	202.6	28.0	10.15	38.5	16.9
		June	219.5	34.1	10.45		
VIIB ...	62	Feb.	212.8	33.0	10.36	10.2	17.0
		June	229.8	31.7	10.7		
VIIA ...	69	Feb.	219.5	35.0	10.45	6.7	20.8
		June	240.3	37.3	10.91		
VIII B ..	60	Feb.	238.6	35.0	10.87	19.1	17.5
		June	256.1	32.9	10 $\frac{1}{2}$ .21		
VIII A ..	56	Feb.	254.1	36.7	10 $\frac{1}{2}$ .17	15.5	3.9
		June	258.0	48.3	10 $\frac{1}{2}$ .24		
Grade median .....		Feb.	183.3	34.9	9.73	18.8	17.3
		June	210.6	34.8	10.28		

To determine if any correlation existed between estimated teaching efficiency and class improvement in the vocabulary test, the writer secured the ratings of several competent judges on a considerable group of teachers in the grades from the IVB to VIIIA. In the IV and V grades where the work was non-departmental, the coefficient of correlation was negative; in the VI, VII and VIII grades where the teachers

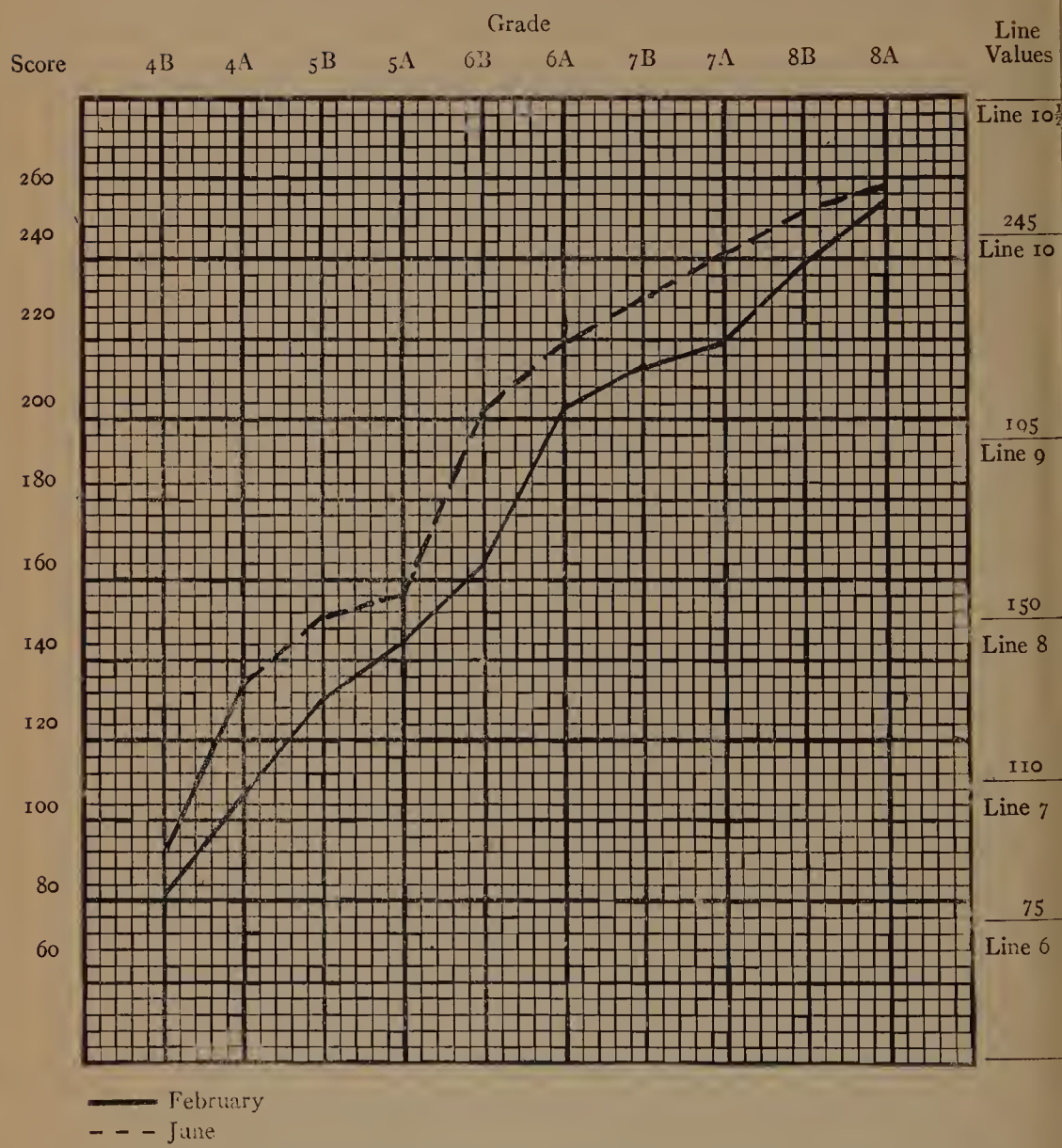


CHART I.—Graphic representation of the progress in visual vocabulary of 754 pupils at Bloomington, Indiana, based on Table I.

of reading and literature were employed for their ability in this line, the coefficient was between 0.6 and 0.7.

SECTION B. THE PROGRESS AS MEASURED BY THE COURTIS TESTS, SERIES B

During the second semester of the school year 1914-15, the writer, in conjunction with Mr. H. L. Smith, then superintendent of the Bloomington, Indiana, schools, gave the Courtis arithmetic tests in all grades of the elementary school from the IVB to the VIIIA, inclusive, for the purpose of measuring the growth in arithmetical achievement of pupils in this system. The tests were given during the first week in February and again the first week in June. The records of the 809 pupils who wrote both tests alone are included.

Table II indicates the number of pupils in each grade who wrote both tests and also the median number of attempts and rights, the percentage of accuracy, the percentage gain in rights, and the percentage gain in accuracy, for each of the four fundamental processes and for both the February and the June tests.

From this table the gain in achievement from grade to grade may be noted for the same date and for each of the processes; also the growth in achievement for each process between the February and June tests for each grade; and relative achievements in the different processes for the same grade and date may be compared.

In explanation of the results here set forth in comparison with those of other systems, it may be noted that formal work in arithmetic is begun in the Bloomington schools in the IIIB grade.

Table II and the accompanying charts show the following features worthy of note: (1) the slight gain from grade to grade in the February addition results for *rights*; (2) the marked gain in *rights* in addition of the June over the February results in Grades VI, VII, VIII; (3) a marked gain in *rights* in subtraction from grade to grade, but a decreasing ratio of gain between the February and June tests from Grade IVB to Grade VIIIA—there being an actual loss in achievement in rights in Grades VIIA, VIIIB, and VIIIA; (4) the slight progress in achievement in multiplication from grade to grade and the lack of improvement of the June over the February results except in Grade IV; (5) the marked gain in division from grade to grade in both tests but the lack of any marked improvement of the June over the February results in any grade—there being a moderate gain in Grades IV, V, and VIIIA; (6) that the actual achievements in attempts, rights, and accuracy in Grade IVB

TABLE II

## ADDITION

GRADE	NO. OF PUPILS	DATE	ATTEMPTS	RIGHTS	ACCURACY	PERCENT GAIN IN	
						Rights	Accuracy
IVB.....	95	Feb. June	5.8 7.0	3.2 3.8	55.2 54.3	18.8	— 0.9
IVA.....	105	Feb. June	6.7 7.9	3.5 4.4	52.2 55.7	25.9	3.5
VB.....	79	Feb. June	8.1 8.3	4.5 4.6	55.5 55.4	2.2	— 0.1
VA.....	107	Feb. June	8.4 8.4	5.3 4.9	63.1 58.3	— 7.5	— 4.8
VIB.....	83	Feb. June	8.7 9.7	5.5 6.9	64 72	25.5	8.0
VIA.....	83	Feb. June	9.0 10.5	5.3 7.5	59 71	41.5	12.0
VIIIB.....	63	Feb. June	9.7 10.8	5.6 8.1	60 75	44.6	15.0
VIIA.....	67	Feb. June	9.8 11.8	6.0 8.4	62 71	40.0	9.0
VIIIB.....	65	Feb. June	11.4 12.0	6.9 9.3	61 78	34.8	17.0
VIIIA.....	62	Feb. June	11.5 13.7	6.3 10.4	55 76	65.1	21.0

## SUBTRACTION

IVB.....	95	Feb. June	5.2 6.7	2.6 4.7	50.0 70.1	80.0	20.1
IVA.....	105	Feb. June	5.7 6.7	3.5 4.2	61.4 62.7	20.0	1.3
VB.....	79	Feb. June	6.7 7.9	4.6 5.1	68.9 64.5	10.9	— 4.4
VA.....	107	Feb. June	7.3 8.1	4.7 5.3	64.8 65.4	13.0	0.6
VIB.....	83	Feb. June	8.0 8.1	5.5 6.0	69 74	9.1	5.0
VIA.....	83	Feb. June	9.1 9.1	7.1 7.2	79 79	1.4	0.0
VIIIB.....	63	Feb. June	9.7 9.5	7.6 7.6	79 80	0.0	1.0
VIIA.....	67	Feb. June	10.4 10.1	7.6 7.2	73 71	— 5.3	— 2.0
VIIIB.....	65	Feb. June	11.0 10.8	8.8 8.3	80 77	— 5.7	— 3.0
VIIIA.....	62	Feb. June	13.0 11.9	10.3 9.7	79 82	— 5.8	3.0

TABLE II—Continued

## MULTIPLICATION

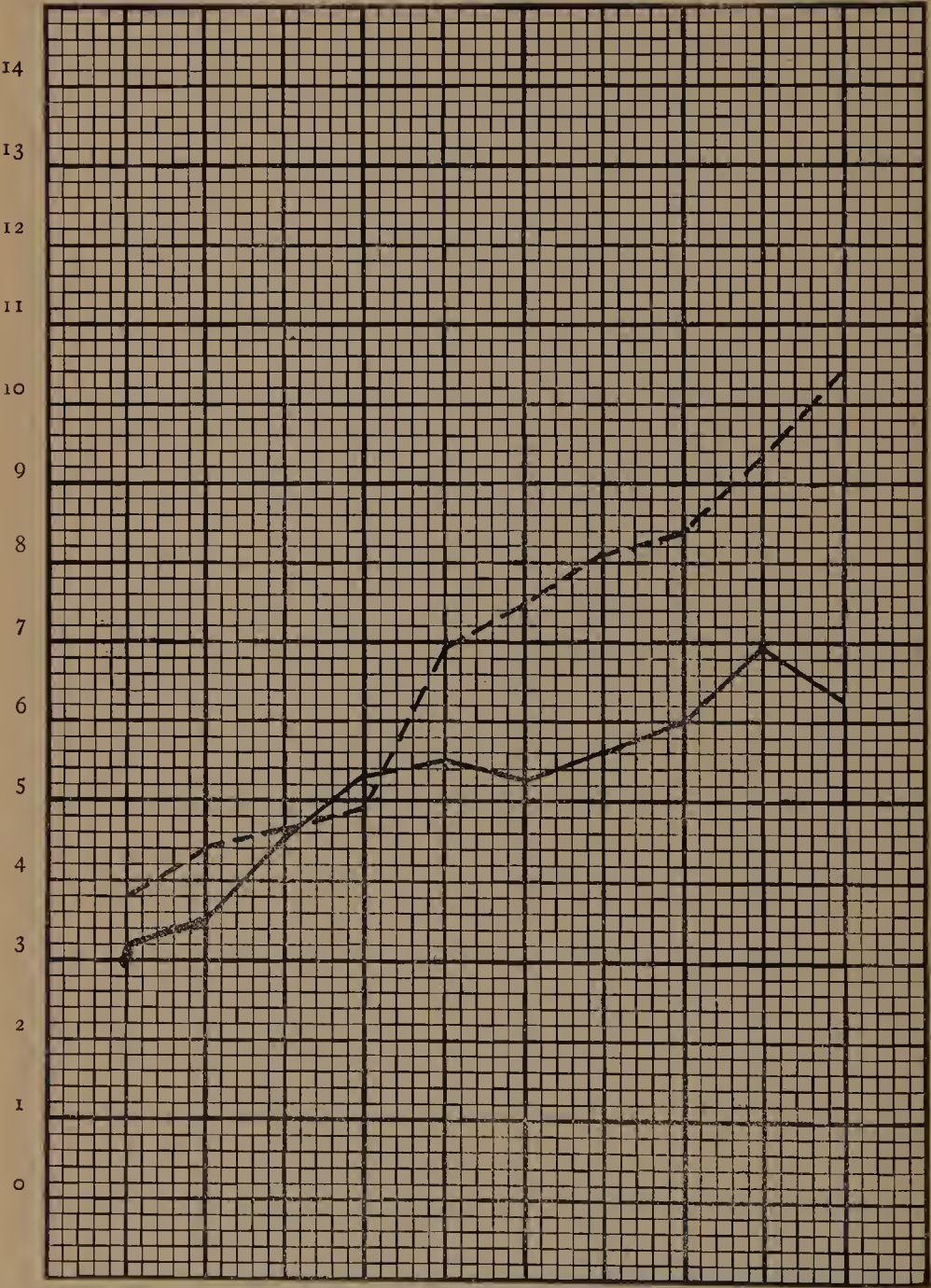
GRADE	NO. OF PUPILS	DATE	ATTEMPTS	RIGHTS	ACCURACY	PERCENT GAIN IN	
						Rights	Accuracy
IVB.....	95	Feb. June	4.2 5.9	1.9 3.2	45.2 54.2	68.4	9.0
IVA.....	105	Feb. June	5.2 6.2	2.4 3.7	46.2 59.7	59.2	13.5
VB.....	79	Feb. June	6.3 6.9	3.9 3.7	61.0 53.6	— 5.1	— 8.3
VA.....	107	Feb. June	6.6 7.1	4.3 4.5	65.1 63.4	4.7	— 1.7
VIB.....	83	Feb. June	6.7 6.6	4.3 4.4	64.2 66.7	2.3	2.5
VIA.....	83	Feb. June	7.0 7.4	4.6 4.7	65.7 63.5	2.2	— 2.2
VIB.....	63	Feb. June	8.0 7.8	5.0 4.7	62.5 60.2	— 6.0	— 2.3
VIIA.....	67	Feb. June	8.5 8.7	5.5 5.4	64.7 62	— 1.8	— 2.7
VIIIB.....	65	Feb. June	9.0 9.4	6.0 6.2	66.7 66.5	3.3	— 0.2
VIIIA.....	62	Feb. June	10.1 10.2	6.2 6.7	61.3 65.7	8.1	4.4

## DIVISION

IVB.....	95	Feb. June	1.3 4.4	0.5 1.8	38.4 40.9	260.0	2.5
IVA.....	105	Feb. June	3.8 4.8	1.5 3.0	39.5 62.5	100.0	23.0
VB.....	79	Feb. June	4.6 5.5	2.8 3.2	60.9 58.2	14.3	— 2.7
VA.....	107	Feb. June	5.5 6.3	3.7 4.6	56.1 73.5	24.3	17.5
VIB.....	83	Feb. June	6.0 6.8	4.6 4.3	76.7 63.2	— 6.5	— 13.5
VIA.....	83	Feb. June	6.5 6.7	5.3 5.4	81.5 80.6	1.9	— 0.9
VIIIB.....	63	Feb. June	7.4 7.3	6.0 6.4	81.0 87.7	6.7	6.7
VIIA.....	67	Feb. June	8.8 8.8	7.1 7.5	80.7 85.2	5.6	4.5
VIIIB.....	65	Feb. June	9.4 9.2	8.2 8.0	87.2 87.0	— 2.4	— 0.7
VIIIA.....	62	Feb. June	10.4 11.1	8.9 9.8	85.6 88.3	10.1	2.2



Grade  
Score      4B    4A    5B    5A    6B    6A    7B    7A    8B    8A



— February  
- - - June

CHART II.—Progress in arithmetical achievement at Bloomington, Indiana. Addition, rights.

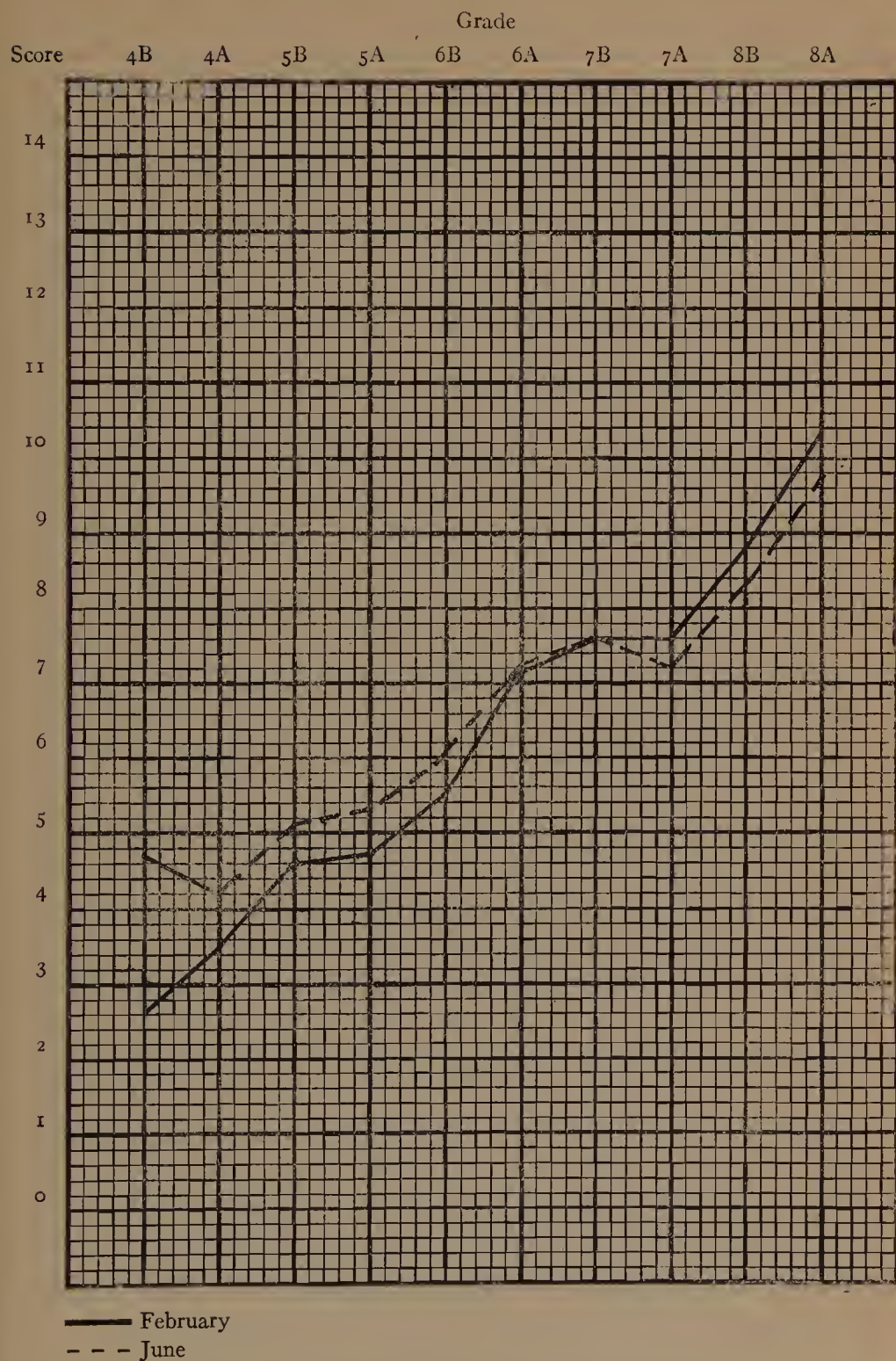


CHART III.—Progress in arithmetical achievement at Bloomington, Indiana.  
Subtraction, rights.

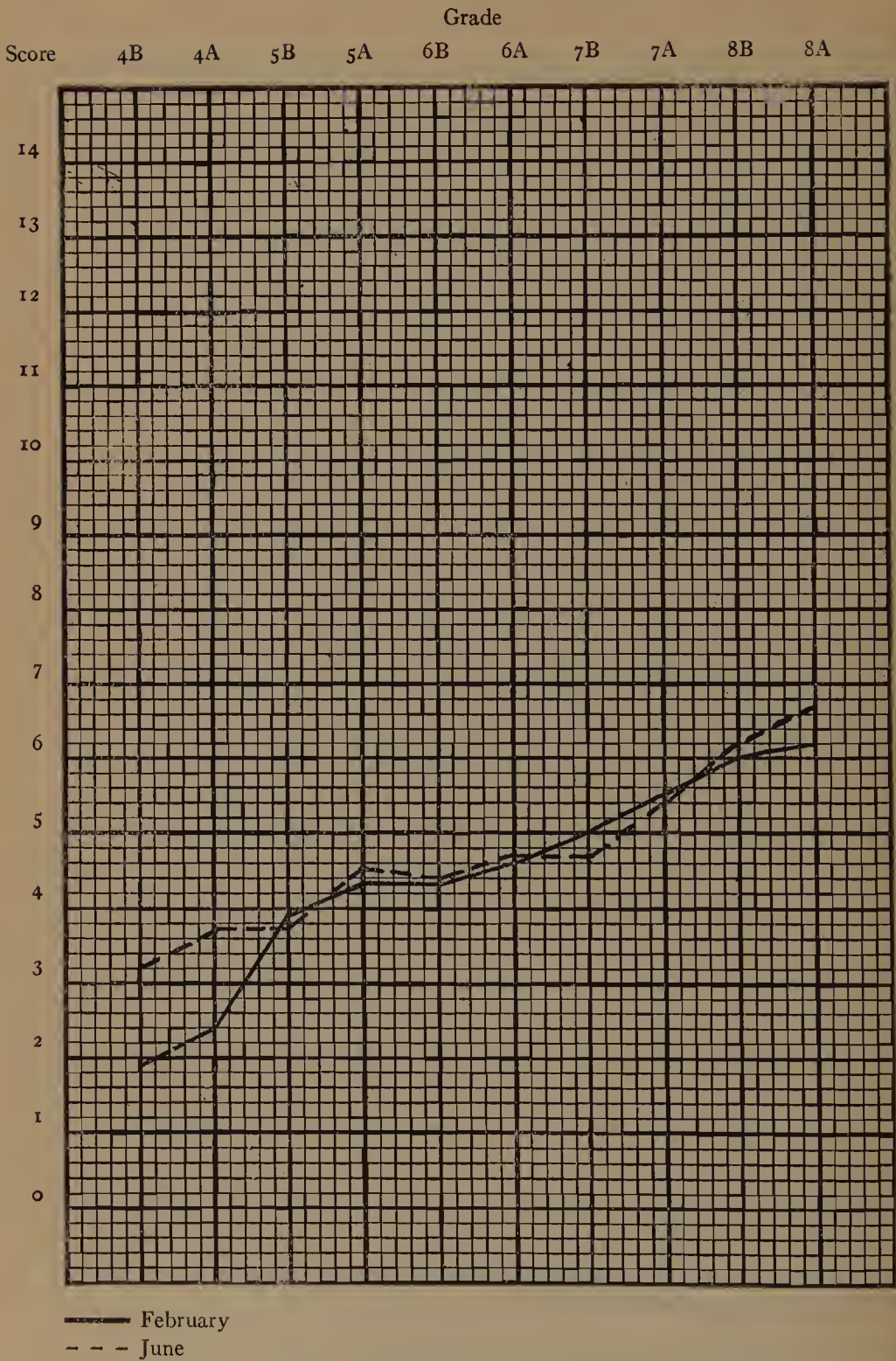


CHART IV.—Progress in arithmetical achievement at Bloomington, Indiana.  
Multiplication, rights.



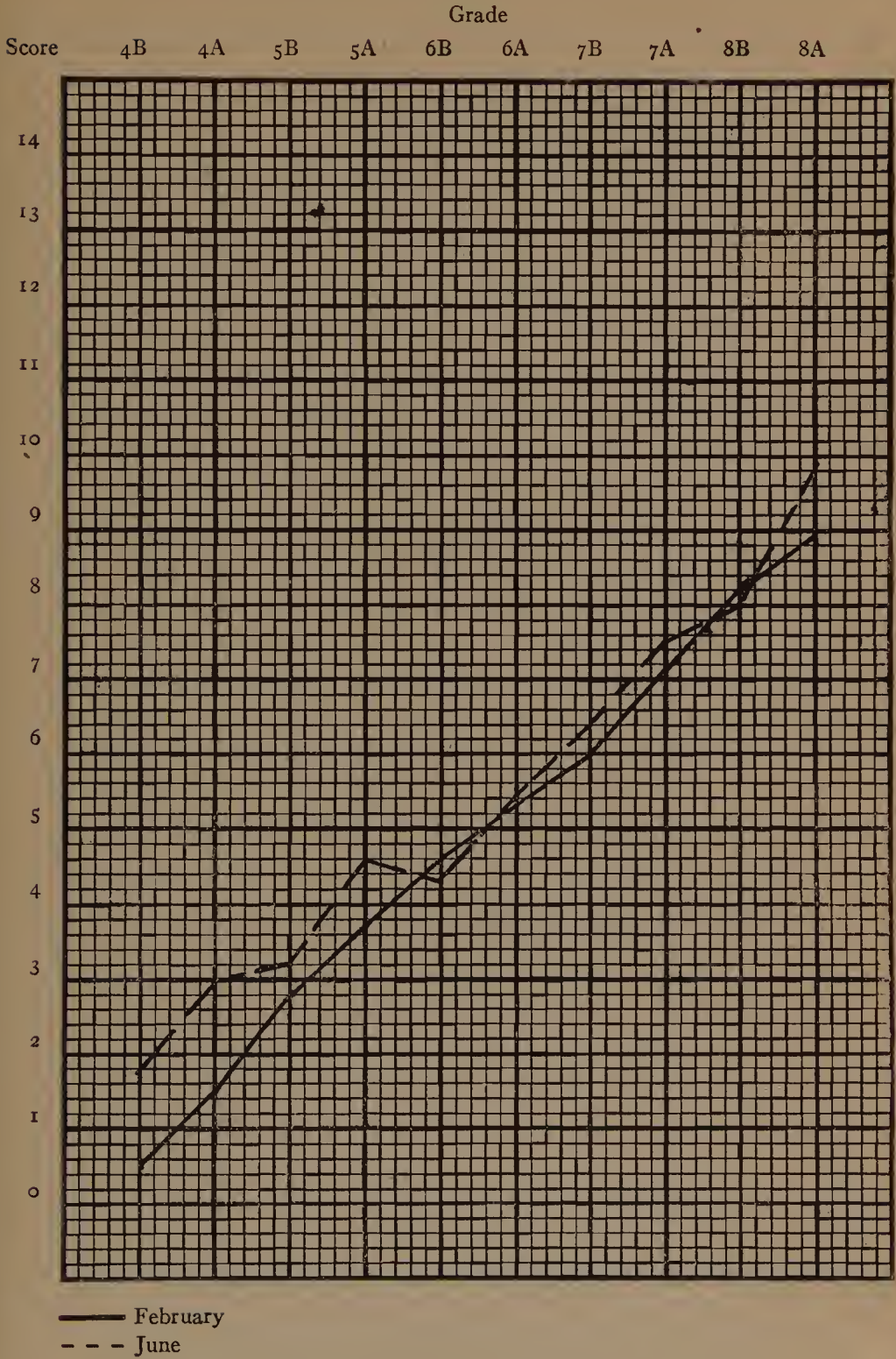


CHART V.—Progress in arithmetical achievement at Bloomington, Indiana. Division, rights.

are highest in the order of processes as follows: addition, subtraction, multiplication, and division. In Grade VIIIA (save for the drill influence in addition) the order is division, subtraction, addition, and multiplication—the latter two have about equal rank; (7) that the increase in accuracy from grade to grade is most pronounced in division, ranging from 38.4 in the IVB February test to 89 in the VIIIA June test; and is least pronounced in addition (save for the drill influence preceding the June test); the percentage of accuracy as indicated by the February test is 55 in both Grades IVB and VIIIA.

The marked gain in accuracy and in rights between the February and the June tests in addition in Grades VI, VII, and VIII, is accounted for by the fact that a five-minute daily drill in addition was given for a period of ten weeks in the interval between the two tests in these grades.<sup>1</sup>

An average gain in rights of 42 per cent and in accuracy of 14 per cent in addition, under drill conditions between the February and June tests, in Grades VI, VII, and VIII, indicates that present standards, under conditions of ordinary class work, are no indication of what these standards should be when experimentation has shown the way to a better procedure.

The marked gain in results in addition between the February and the June tests and the lack of gains in the other processes in Grades VI, VII, and VIII indicate that results may be expected at the point where pressure is exerted and that there is no appreciable transfer of training from one process to another.

In grades from IVB to VIIIA, the teachers were rated as to their general efficiency by four judges and the averages of these ratings were correlated with the amount each teacher's class gains in arithmetic were above or below the median class gain, as measured by the February and June tests. In Grades IV and V, where the teachers have charge of all subjects, the Pearson coefficient was about  $+0.30$ , but in the departmental grades, where teachers of arithmetic are employed because of their proficiency in teaching this subject, the coefficient of correlation was above  $+0.90$ .

These results are offered as data from one school system only and are not to be considered as determined general standards of achievement and growth in arithmetical abilities.

<sup>1</sup> Acknowledgments are due to Miss Mary Kerr, principal of the departmental school, who planned and carried out the drill work in addition and assisted in the tabulation of results.



## CHAPTER VIII

### COURTIS TESTS IN ARITHMETIC: VALUE TO SUPERINTENDENTS AND TEACHERS

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S. A. COURTIS

Supervisor of Educational Research, Detroit, Michigan

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From August 1, 1914, to August 1, 1915, between four and five hundred thousand tests (455,007) of the various Courtis standard research tests were sent from Detroit to school men in 42 different states. This material was mainly Series B Arithmetic Tests, and the growth from the use of the tests by a single school in 1909 may be taken as an index of the growth throughout the United States of the interest in the movement for measurement. It should be evident at once that if this great quantity of material is being used so as to result in benefit to the schools tested, then measurement must be already exerting throughout the country a very widespread influence on the teaching of arithmetic. On the other hand, this extensive use of testing material may represent merely natural curiosity and an experimental trial by wide-awake school men of a new and much-discussed type of examination.

Fortunately, measurement itself is not on trial. The movement for measurement is merely an application of scientific methods to the study of educational problems. Both as a general method for the discovery of natural law and as a method of proved worth in education, the method of science rests on so sure a foundation that for a school man to declare that in his hands measurement has been a failure is to confess his own lack of training or his own incompetency. As for the Courtis tests, they were designed by the writer for a specific purpose, viz., to measure the effects of his own teaching and of methods invented to improve its efficiency. This purpose has been successfully accomplished. For the writer's own purposes the tests yield results which are satisfactory and which have fully justified the time and effort given to the testing work. Further, the returns received from other schools to which the tests were sold on the co-operative basis have yielded information which has proved of the highest professional interest and value to

him. Moreover, the tests have given satisfactory service in the hands of so many professors and students of education that their value as tools for educational research is well established. But whether or not either the method or the tests are of value to superintendents and teachers generally is quite a different question.

Accordingly, at the request of the chairman of the Committee on Standards and Tests of Efficiency, an investigation of this question was undertaken. The following letter was sent to 200 superintendents in 30 states, all of whom had recently purchased copies of the Series B Arithmetic Tests:

DEAR SIR:

I am in receipt of a request from the Committee on Standards of the N.E.A. asking for the conclusions of superintendents as to whether or not the use of the Curtis Standard Tests in Arithmetic has been of any value to them or to their teachers from the standpoint of school administration or teaching. Any statement that you may be willing to send me will be forwarded to the committee.

Thanking you for such assistance as you may be willing to give, I am,

Yours very truly,

S. A. COURTIS

At this writing replies have been received from 87 superintendents in 30 states and they are still coming in. The states represented are Alabama, California, Colorado, Connecticut, Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Montana, Nebraska, New Hampshire, New Jersey, New York, North Carolina, Ohio, Oklahoma, Oregon, Pennsylvania, Rhode Island, Tennessee, Texas, Utah, Virginia, Washington, West Virginia, Wisconsin, and Wyoming.

The general tone of these letters is remarkable for its enthusiastic commendation of the value of measurement to superintendents, teachers, and pupils. Such expressions as "Delighted with results," "Should not like to do without them," "Do more than anything else we have ever tried," or their equivalents, occur in the majority of the letters. Seven of the eighty-seven stated that their results have not been tabulated because of lack of time. Only two express dissatisfaction. The following letter represents the extreme of unfavorable comment:

Replying to yours of the 29th ultimo, I regret to say that I have not discovered any material benefit from the Curtis tests as we applied them last year.

If one had a large amount of statistical assistance they might be worth while, but as a superintendent with a limited force I question their value.

Yours sincerely,

[The name is omitted for obvious reasons.]

On the other hand, many of the other letters show a careful study of the problem and a thorough analysis and formulation of the benefits. The following letter is an illustration:

BURLINGTON, IOWA, October 4, 1915

Mr. S. A. Courtis

82 Eliot Street

Detroit, Mich.

DEAR SIR: The Courtis Standard Tests in Arithmetic have been of great value to me in indicating:

I. The school or schools in which there is a regular increase in ability of the pupils in the fundamentals of arithmetic. Such knowledge has enabled me to suggest to the principals in those buildings where there is no such regular increase in ability of the pupils methods of bettering the product of their teaching.

II. The room or grade in which there has been no increase in ability during the semester. This indicates in some measure the work which the teacher is doing. It affords the superintendent an excellent basis for discussing in detail with the teacher the faults or good points in her work.

III. The school or grades in which there is a tendency to emphasize the work of the fundamentals beyond what is reasonable. Teachers like to do what they can do well. Their interest in those subjects which they like sometimes carries them too far.

From the statements made to me by teachers and principals I am confident that the tests have *not produced* as good results as they should, but this is not the fault of the tests. As the teachers come to understand the purpose of the tests, the value of this work becomes more and more apparent to all.

I do not think that we care to give up the tests under any circumstances.

Yours very truly,

W. L. HANSON, *Superintendent*

It is to be regretted that space prevents quotations from many others. Replies were tabulated, as follows:

Replies			
Total replies received.....	87	Tabulations not completed.....	7
Unfavorable.....	2	Favorable.....	78

Benefits Mentioned

General answers only . . . . .	17	Reveal needs of individuals. . . . .	23
Comparison with other cities. . . .	14	Stimulate teachers. . . . .	23
Comparison from grade to grade. .	7	Stimulate pupils. . . . .	17
Reveal weak points in school work	11	Furnish standards. . . . .	24
Reveal weak teachers. . . . .	13	Furnish incentive or motive. . . . .	16

The results do not lend themselves to statistical tabulation, owing to the variation in the forms used in expressing the same ideas. Other important uses appearing in these letters are "Measurement of the efficiency of various methods," "Measurement of the progress of individual children," "Value in grading," "Awakening of spirit of investigation among teachers," "Satisfaction of parents."

The conclusions to be drawn from the foregoing data are that for the most part the superintendents who applied for standard tests are making legitimate use of them for purposes of supervision; that these men value the comparison from city to city—made possible by uniform tests and conditions—as a check upon the main character of the work done in their own systems; that the use of standard tests results in the setting up of objective standards which affect the work of teachers and pupils favorably, both by making clear the goal to be attained and by furnishing motives for individual effort; that the tests are of great value in the determination of the needs of individual children and in the adjustment of school work in arithmetic to such needs; that the tests have some value, the amount of which is yet to be determined, in the judging of the efficiency of teachers and in determining the grades of children; that few superintendents are making use of the tests in a scientific study of the comparative efficiency of different methods of teaching.

The rapid increase in the number of tests that have been used each year is, therefore, probably due more to the value of the results secured than to mere curiosity in a passing fad. The use of standard tests for purposes of supervisory control under such conditions is sure eventually to have profound influence upon the teaching of arithmetic.

The writer is glad to have this chance to express his appreciation of the co-operation of the many school workers who have made this extensive experimental use of the research material possible. The financial burden and office labor of carrying on, without profit, a co-operative

venture totaling some \$5,000 or \$6,000 a year has not been light; neither has the labor of tabulation of returns. It is therefore gratifying to find that this work has been of real value to many superintendents, and the result of the investigations made for the committee will be to stimulate further efforts to secure standards of teaching efficiency and to extend the range of the testing material.

#### VALIDITY OF STANDARD SCORES

The first tests in arithmetic were issued in 1911 and distributed widely in an attempt to secure standards for use in the writer's own classes. The first tabulation of the returns obtained was in June, 1911, and every year since that date additional tabulations have been made. Series B tests were issued at the beginning of the year 1913-14, and standards based upon the first tabulations were issued in February, 1914. At this time, however, both the tests and the method had reached a stage of development which made possible effective work, so that no change in standards has been necessary since that time, although tabulations of larger and larger numbers of scores have been repeatedly made. The standard scores set for Series B are as shown in Table I.

TABLE I  
STANDARD (JUNE) SCORES. SERIES B TESTS

Grade	Test 1 Addition	Test 2 Subtraction	Test 3 Multiplication	Test 4 Division
III.....	3	4	3	2
IV.....	5	6	5	4
V.....	7	8	7	6
VI.....	9	10	9	8
VII.....	11	11	10	10
VIII.....	12	12	11	11

Standard accuracy = 100 per cent.

The scores given in Table I represent approximately the median speed of work for the different grades and are based upon returns that are nearly nation-wide in scope. The range of variation in schools in different cities and states is approximately four examples above and below the median; i.e., in some school systems the median eighth-grade scores will rise as high as 16 examples in addition and others go as low



as 8 examples. Not more than five eighth-grade classes per hundred will exceed these limits, except as very peculiar and special conditions prevail. On the other hand, the range of speed of work in individuals varies from a score of but two or three examples to scores of twenty-four examples, the limit of the test.

The conditions from city to city do not show greater variation in achievement than are to be found in any one city, such as Boston or Detroit, where there is a large number of classes of the same grade. If returns from small cities or country schools only were tabulated, the median scores for any given grade would probably tend to be somewhat lower. The large-city school apparently emphasizes the drill work. The problem of setting of an adequate standard is, therefore, a difficult one. Any standard adopted must take into consideration the effect of a number of different factors. All things considered, it has seemed best to take as a standard of speed the median speed derived from tabulations of all types of systems. There should certainly be no attempt to press training in addition, for instance, to very high levels of ability at the expense of more important work, and very few school men are willing to neglect in any way training in such fundamental abilities as the four operations. Median *speed*, determined from a wide range of conditions, probably represents the optimal speed at which children can work. A trial in the classroom of such speeds as standards has yielded satisfactory results.

The question of standards of *accuracy*, however, is a much more difficult one to settle, because less information is available and there is more room for a play of personal opinion. The writer has as yet reached no conclusion in the matter, but is endeavoring to determine the degree of accuracy which it is practical to attain under classroom conditions. For this purpose it is necessary to set before teachers as a goal to be reached the highest ideals possible—i.e., 100 per cent accuracy—then to determine in terms of the percentage of the class reaching this goal the degree of success which it is possible to attain. For instance, the average percentage of children of the eighth grade who show median speed with 100 per cent accuracy in first draft work is between 5 and 10 per cent. Experiment proves, however, that it is easily possible to raise the group showing perfect accuracy to 20 or 30 per cent of the class membership and markedly to increase the number of children working with accuracies of 90 and 80 per cent. There is even reason to

expect that with proper methods of training and by employing standards throughout the whole school system, and without change in the time given to arithmetic, it will be possible eventually to secure perfect accuracy in from 60 to 75 per cent of the children. For the classes under his immediate control the writer prefers to keep the standards of median speed and 100 per cent accuracy as the goals to be attained. He recognizes clearly, however, that at present this choice of standards must rest upon personal convictions only, and school men should feel free to change these standards to suit their own opinions.

There are, however, certain facts, other than the achievements of the pupils themselves, which ought to be considered in the determining of standards. One of these is the social value of the abilities developed by school work. The writer has attempted to answer this question by the measurement of as many adults as possible.

The first attempt along this line was made in connection with a survey of the New York schools for the Committee on School Inquiry. Through the kindness and co-operation of Mr. W. D. Ernest, chief of Cadet Staff and member of the John Wanamaker New York Commercial Institute, the consent of Mr. Lynn, general manager of the John Wanamaker department store, New York City, was secured to the testing of 50 employees of the company. This group was tested precisely as if it had been a class of children in school. It met in one of the company's schoolrooms and was tested by one of the force of trained examiners used in the New York survey. Exactly the same tests and time allowances were used as for the children and the same procedure in conducting the examination and in scoring and tabulating the papers was followed throughout. Forty-one complete records were obtained. The subjects represented six different types of positions in the store and in numbers were as follows:

Auditing department.....	5	Salesmen.....	7
Billing clerks.....	5	Typists.....	3
Cashiers.....	8		<hr/>
Clerks.....	13	Total.....	41

Two of the clerks and six of the sales people were men. The average age of the group was approximately nineteen years, ranging from fifteen to thirty years. The average term of service for the company, except for the group from the auditing department, was a little more than two years, ranging from two months to five years. The girls from the auditing

department are the product of the store's own training and the term of service for them ranged from eight to fourteen years. The wage paid any member of the group is determined by position and term of service, not by position alone. The amount ranged from five to fifteen dollars per week. Of thirty-six who reported the last grade attended in public school, seven

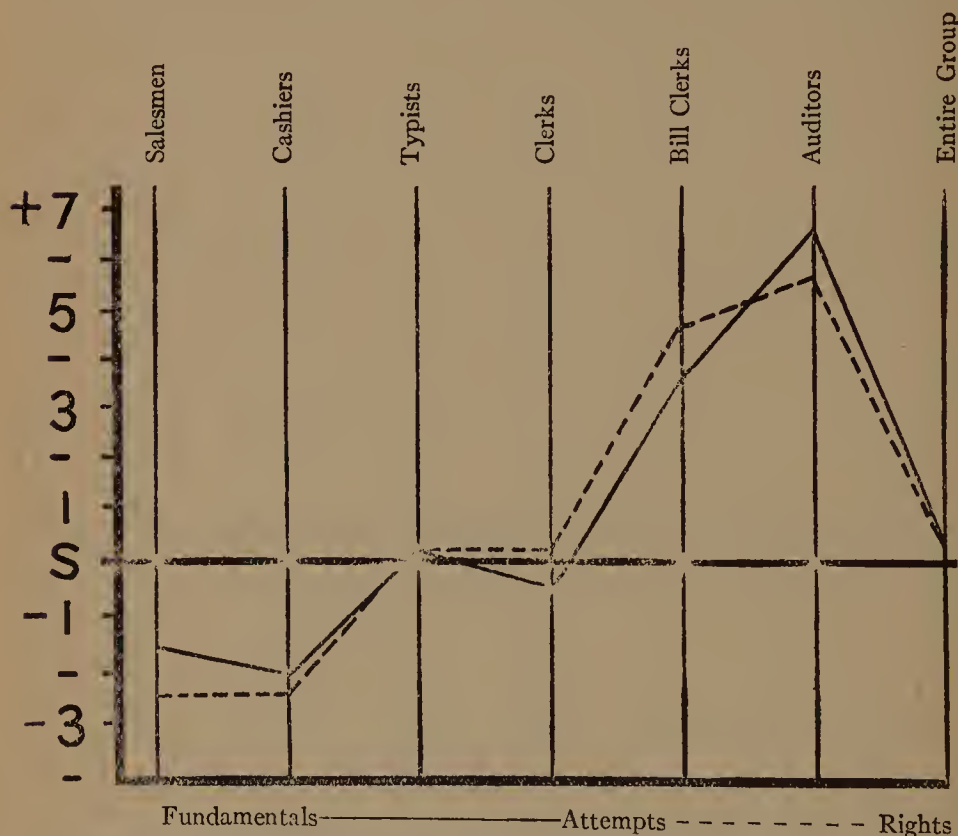


CHART I.—Line marked S indicates eighth-grade standard. Scale at left shows deviations above and below standard.

gave high school, thirteen had completed the elementary grades, and sixteen were in either the seventh or the eighth grade of the grammar school when they left.

It was not possible to attempt more than a general study of the work of the different groups. The cashiers do little more than make change; the clerks and salesmen have a little computation work in the handling of sales slips, store records, etc.; the members of the auditing department have a larger amount of abstract work and it is routine in

character. The auditing department and, to a lesser extent, the billing clerks are thus the only positions in which arithmetical ability would have more than a slight influence in determining the fitness of the applicant.

The tests used were Series A, and in Table II the results are given for Test 7 only, a test in the four operations with whole numbers. The scores given in this test do not differ markedly from those of Series B; the eighth-grade standard score is about  $2\frac{1}{2}$  examples higher. The results of the tests are given in Table II and shown in the graph (Chart I; see p. 98).

TABLE II  
PART B. AVERAGE SCORES

Position	Attempts	Rights
Salesmen.....	12.9	7.7
Cashiers.....	12.4	7.7
Typists.....	14.7	9.7
Clerks.....	14.1	9.7
Bill clerks.....	17.8*	14.6*
Auditors.....	21.0*	15.4*
Entire group.....	14.4	10.4

\* Computed scores. Entire tests finished in less than time allowed.

It will be noted that the scores of salesmen and cashiers fall below the eighth-grade standards (14.4 examples attempted, 10 examples right); those of the typists and clerks are almost exactly at standard; and those of the billing clerks and of the auditing department run considerably above standard. Two members from the auditing department had very high scores; the best one finished the test in so short a time that had enough material been furnished to keep her busy during the whole time allowed, her score would have been 38 attempted and 34 right.

Before commenting on these results, however, similar results from other sources will be presented. Through the co-operation of Miss Adelaide Baylor, clerk of the Board of Education for the state of Indiana, and the kindness of Mr. Jesse Moore, president of the Columbia School Supply Company, tests were given to a group of 66 factory laborers. These workmen were of three classes: a group of 20, mostly colored men, represented the cheapest labor employed in the factory, average



wage 10 to 12 cents per hour; a second group of 26 men represented the median wage in the factory, average 17.6 cents an hour; a third type represented the best labor in the factory outside of the office, average wage 21 cents an hour. Tests were also given to a group of 13 saleswomen, ranging in age from nineteen to thirty-six. The average score made by these four groups of employees is shown in Table III.

Through the kindness of personal friends and the co-operation of Mr. Boyd Fisher, secretary of the Executive Club of the Detroit Board of Commerce, additional records have been secured from various types of adults. It is difficult, however, to obtain complete data in such cases, as information in regard to either age, salary, or occupation is likely to be missing. However, in Table III will be found the records of a group of low-wage girls ranging in age from eighteen to twenty-five, with average pay of \$400 per year; 3 stenographers, age eighteen; 5 adult women, ranging in age from thirty-seven to forty-six, who give their occupation as housewife; a group of high-wage women ranging in age from twenty-one to forty and in salary from \$700 to \$1,200 per year; 14 boys and men representing machinists, steam-fitters, bookkeepers, railway foremen, railway clerks, trimmers, and salesmen, ranging in age from nineteen to forty-four and in salary from \$350 to \$900 a year; a group of 7 high-priced men of independent means, ranging from thirty-seven to fifty-nine years of age; a group of 44 Iowa superintendents, ranging in salary from \$800 to \$4,500, and a similar group of Michigan superintendents, all about thirty-five years of age, and ranging in salary from \$600 to \$3,600; a group of 17 office employees of an automobile company in Detroit, ranging in age from eighteen to thirty-two, and in salary from \$700 to \$1,500 per year; a group of 28 employees of the City Gas Company, ranging in salary from \$300 to \$5,000 per year; a group of approximately 80 teachers, mostly women, attending the summer school of the George Peabody College for Teachers, ranging in age from twenty to forty-five. In Table IV, the individual scores of one of the groups are given in full.

It is evident from these tables that there is an apparent correlation between the earning capacity of adults and their scores, but whether this is a causal relation or not is another question. The fact that a man attains a high position in society is more likely to be due to the superior quality of his general abilities than to his ability in arithmetic alone. An able individual will profit more by school training than one less gifted,



TABLE III

SCORES IN SERIES B TESTS MADE BY VARIOUS GROUPS OF ADULTS

OCCUPATION	NUMBER OF INDIVIDUALS	AGE	WAGES	ADDITION			SUBTRACTION			MULTIPLICATION			DIVISION		
				Attempts	Rights	Accuracy Per cent	Attempts	Rights	Accuracy Per cent	Attempts	Rights	Accuracy Per cent	Attempts	Rights	Accuracy Per cent
Columbia School Supply Co.:															
Laborers.....	20	.....	10-12 cents	2.9	.9	31	2.9	.9	31	1.7	.3	17	1.0	.4	40
Laborers.....	28	.....	12-37½ cents	6.6	4.0	61	5.0	2.6	52	4.8	2.0	42	2.7	1.1	41
Laborers.....	20	.....	21	8.0	4.8	60	5.7	5.0	87	6.0	3.8	63	3.8	2.6	71
Low-wage girls.....	5	18-25	\$ 400	11.4	8.9	78	14.4	12.6	87	10.0	6.8	68	10.2	8.8	86
Stenographers.....	3	18	.....	12.0	9.0	75	17.3	12.7	73	12.7	9.0	71	14.0	12.0	86
Housewives.....	5	37-46	.....	12.4	9.8	79	13.0	11.4	88	9.0	6.8	76	9.2	7.0	76
Teachers attending George Peabody School for Teachers (summer).....	.....	20-45	.....	12.7	9.5	75	16.2	12.8	79	11.7	9.5	81	14.6	13.9	95
High-wage women.....	4	21-40	\$700-\$1,200	14.2	11.5	81	23.2	18.2	78	15.5	13.7	88	16.7	16.0	96
Saleswomen.....	12	19-36	.....	14.8	12.0	81	11.9	8.8	74	10.0	6.4	64	8.1	6.0	74
Office employees, Automobile Co.	17	18-32	\$700-\$1,500	18.7	15.2	81	19.2	16.6	86	16.0	12.9	81	16.4	15.5	95
Miscellaneous.....	14	19-44	\$350-\$ 900	16.2	13.3	83	15.4	14.1	91	12.0	9.3	77	9.8	8.6	88
Iowa superintendents.....	44	.....	\$800-\$4,500	16.0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Michigan superintendents.....	35	.....	\$600-\$3,600	.....	.....	.....	.....	.....	.....	15.0	11.8	79	.....	.....	.....
High-wage men of independent means.....	7	.....	.....	19.1	17.0	89	18.6	15.6	84	12.3	10.7	87	10.3	9.7	94
City Gas Co.....	28	.....	\$300-\$5,000	21.0	18.0	86	18.0	15.5	86	16.5	13.0	79	16.0	13.2	82

as Thorndike has shown. Nevertheless, the fact remains that individuals who occupy positions of large earning capacity have greater ability in the four operations than those of less earning capacity.

TABLE IV  
INDIVIDUAL SCORES: OFFICE FORCE—AUTOMOBILE COMPANY

MONTHLY SALARY	AGE	DEPARTMENT	TEST NO. 1		TEST NO. 2		TEST NO. 3		TEST NO. 4	
			At- tempts	Rights	At- tempts	Rights	At- tempts	Rights	At- tempts	Rights
\$24.00..	14	Office boy .....	.....	.....	.....	.....	13	6	11	8
60.00..	18	Estimating .....	21	19	23	20	21	18	17	13
65.00..	21	Drafting .....	10	2	9	9	11	7	5	3
65.00..	22	Estimating .....	18	13	22	16	16	14	23	23
65.00..	21	Engineering .....	16	14	18	17	16	13	17	17
65.00..	21	Estimating .....	10	5	10	6	7	3	12	10
70.00..	26	Order .....	16	14	14	13	14	10	12	12
70.00..	24	Estimating .....	24	23	24	24	24	22	24	24
70.00..	24	Estimating .....	18	11	17	14	12	10	16	16
75.00..	24	Drafting .....	12	5	16	9	15	8	15	14
75.00..	27	Timekeeper .....	24	22	24	19	19	17	12	11
75.00..	25	Cost clerk .....	19	14	20	16	12	10	12	12
75.00..	23	.....	15	12	22	20	14	12	19	19
80.00..	23	Cost clerk .....	24	23	22	20	19	19	24	24
85.00..	24	Timekeeper .....	24	21	23	21	20	17	24	23
90.00..	27	Bookkeeper .....	24	24	20	19	14	10	12	11
125.00..	32	Accountant .....	24	21	24	22	24	23	24	24
Total .....			299	243	308	265	271	219	279	264
Average .....			18.7	15.2	19.2	16.6	16.0	12.9	16.4	15.5

The figures in the tables give some indication of the levels of ability to which it is wise to develop such skills in children; for it must be remembered that one of the functions of the elementary school is to equip children with the essential tools for their life-work. The elementary school is not at all concerned with vocational training. If a boy wishes to become an accountant, the development of additional degrees of skill in the four operations must be the work of the vocational school; for the elementary school is concerned only with the development of skill necessary to meet the demands of an average life.

The figures in the tables show that the level of ability represented by scores of 17 examples<sup>1</sup> would be adequate for the general demands of a

<sup>1</sup> See Chart II.

successful life. Tabulations of the actual scores of eighth-grade children, as has been mentioned above, indicate a median speed of 12 examples. Considering the changes in speed of work which take place from the fourteenth to the twenty-fourth year, owing to maturity alone, it is possible to say that 12 examples represent an adequate speed for the eighth grade. The records of adults so far tabulated thus tend to confirm the standards previously adopted as being suitable goals for the elementary grades.

For those who accept the reasoning in the foregoing paragraphs an important decision will need to be made at once. At the present time 50 per cent of the children already equal or exceed the speed suggested as standard, 12 examples in addition. Also 50 per cent of the children fall below this speed. It is evident that many children in the grades now require additional training to develop adequate speed and it is equally true that a very large number of children have already greatly exceeded adult skill. For instance, in the report of the survey of the school system of Salt Lake City, Utah, in addition 4 per cent of the eighth-grade children equaled or exceeded 16 examples and 27 per cent exceeded 12 examples. If a speed of 12 examples is adequate for the demands of life, then it is a waste of time to give the children additional work tending to develop their skill beyond this point; yet where 75 per cent of the children need such drill to a greater or less degree it is evident that there must be a large element of waste in any form of class training in addition. The adoption of standards carries with it the idea of limitation of the direct training to the standard adopted. For those who adopt the limitation of training as an educational principle new class methods must be devised which permit of the elimination of individuals from the drill classes as soon as the standards have been reached and the setting of the child's time free for more profitable work.

In this connection it is interesting to note that skill in certain individuals may develop almost without limit under additional training. Certain adults have finished the Addition Test No. 1, Series B, in a time interval which represents scores of 60 to 70 examples with nearly perfect accuracy in the standard time limit. The scores of certain eighth-grade classes in schools which give an excessive amount of drill show correspondingly high results for children fourteen years of age. As the standard is raised above 12 examples, however, it requires an increasing effort to reach the higher levels. Moreover, a sorting on the basis of salary

of the various scores made by men tends to show that after a certain critical level is reached additional degrees of skill do not necessarily mean greater earning power. In the graph shown in Chart II, for instance, the two axes represent scores in addition (number of examples attempted, Test 1, Series B) and annual salary. The various cross-marks represent the scores and salaries of individual adults. The circles

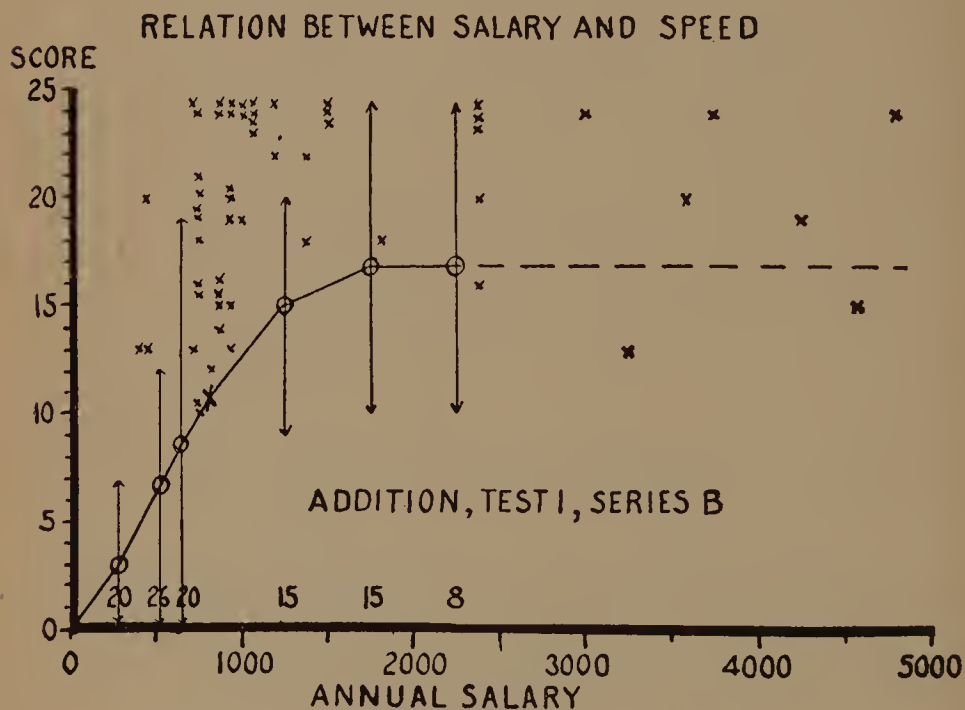


CHART II

on the curve represent the median scores of homogeneous groups of workers—first three, laborers; the last three, Iowa superintendents. The arrows show the range within the groups tabulated and the figures along the base of the graph represent the number of individuals in each group.

It will be seen from the graph that the curve tends to approach a maximum of 17 examples from a salary of \$1,800 and up. It is to be noted, also, that even in the lower ranges of salary there are individuals of very high scores. The writer interprets the results shown to mean that in a general way earning capacity increases with ability to add, up to the critical value, and that beyond this limit additional skill has

relatively no effect upon earning capacity. Perhaps a better form of statement would be that the time soon arrives in a man's life when ability to add ceases to be a determining factor in his social efficiency. On the lower levels of general ability, ability to add may have more determining force than on the higher levels. All these considerations seem to point to limitation of training as a desirable procedure in the grades, and the general adoption of the scores recommended as standard with the consequent elimination from the drill classes of all individuals who reach this standard would undoubtedly improve the efficiency of teaching.

Standards of speed, however, are of little value in themselves, as the quality of work must also be considered. The results given in Table II throw some light upon a problem of accuracy also. There is apparent correlation between earning power and accuracy, and the levels of accuracy for the more capable groups range from 75 to 95 per cent, depending somewhat upon the operation. Children who attain fixed habits which enable them in straight-ahead work to maintain an accuracy of 85 per cent will probably be able to hold any position which is open to them. It is also probable that the final standard of accuracy adopted will be less than 100 per cent; but, as stated above, the writer is not yet willing to make a final statement in regard to such standards.

#### EFFICIENCY

With the adoption of definite standards for speed and accuracy efficiency may be defined in terms as rigid as those used in physical science. The efficiency of any test is the percentage of the total class membership which is able to work at standard speed with standard accuracy. Thus, if 12 examples in 8 minutes and 100 per cent accuracy be taken as standard scores, and if in a class of 40 there are 8 children able to equal or exceed these scores, the efficiency of the teaching would be represented by  $8/40$ , or 20 per cent. The average efficiency of present-day teaching of addition ranges from 5 to 10 per cent if figured on this basis. If figured on the basis of a lower standard of accuracy (see standards adopted by Boston) the efficiency is, of course, largely increased. If standard tests are given at the beginning and the close of the year the efficiency of the teaching effort for the year would be represented by the difference between the initial and final efficiencies.

Such a definition of efficiency is, of course, open to the objection of unequal units, since to raise one child to standard scores may not be at



all equal to raising another child of very different initial abilities to the same scores. However, in any unselected class of 20 children the range of individual abilities will be so great that the objection of unequal units is of no practical significance. Further, it should be most carefully noted that efficiency, as here defined, is simply a measure of how completely the goals set as standards have been attained; it is not at all a measure of the movement within the class toward these goals. It is probable that a measure of this latter quantity is also needed. For the immediate problem for the future is the determination of standards of teaching efficiency in terms of objective scores for speed, accuracy, and amount of time given to the subject.

## CHAPTER IX

### USE OF STANDARD TESTS AT SALT LAKE CITY, UTAH

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In May, 1915, a survey of the public-school system of Salt Lake City, Utah, was conducted by a corps of five workers, of which I was director. One of the problems presented at Salt Lake City was that of estimating the efficiency of the instruction given. This was made especially important by reason of the fact that there had been much criticism in the city, on the part of the business men, of the instruction in the so-called fundamental subjects in the schools.

Accordingly, the survey force undertook to measure the instruction in writing, spelling, composition, arithmetic, and reading in the elementary schools of the city. For this purpose nineteen of the thirty schools were selected, with due care to touch every type of community from the standpoint of population, social and economic status, and general school conditions. The tests were used with the "B" or upper classes of each grade only. The tests used were those standard tests which have been employed in a number of other cities, and the methods used in giving and scoring the tests were as nearly as possible the same as in other cities, so as to get as nearly as possible comparable results.

1. *Spelling*.—The test in spelling was made by using the ten words selected by Dr. Leonard P. Ayres and used in the Springfield survey. The list of words was pronounced to the children by the regular classroom teachers in the presence of a member of the survey staff, and ordinary classroom procedure was followed with reference to such matters as writing, pronouncing words of more than one meaning, etc. The papers were then collected, immediately scored by the teacher, and turned over to the member of the survey staff who was present.

The results of the test showed that both by grades and for the city as a whole the spelling in Salt Lake City was particularly good. The average for the city as a whole was 86.0, as against an expectancy of 70.0. Individual schools averaged as high as 93.0, while the lowest

was 77.2. A more detailed examination of the results, however, showed large variations between rooms and among individuals within rooms. This is commented on at some length in the survey report. The general conclusions are that the test itself was entirely too easy, that for 40 per cent of the children it was no test at all, and that the city is obtaining a degree of efficiency in spelling beyond what might reasonably be expected of the schools. An examination of the time schedule also showed that the efficiency was obtained by an expenditure of time completely beyond what might reasonably be expected of a school system.

2. *Composition*.—For this test a brief composition was devised, similar to that which had been used at Butte and elsewhere, and the children were asked to express themselves on paper. The test was made in Grades IV–VIII inclusive. The scoring was done in terms of the Hillegas scale, not because this scale is itself a perfect one, but because it had been used in a number of other cities, and by using it comparable results from elsewhere could be set up beside the Salt Lake City results.

The general result of the test showed that the children were well qualified for language work, viewed as groups, but that individual children showed wide variations in their ability to use English. The variations were so wide that it was evident that the ordinary composition work could not be conducted in the schools without making it far too easy for some and far too difficult for others. The composition work did show some marked evidence of imagination and free expression, and the results, compared with those in other cities, showed that Salt Lake City stood well in the composition tests. It was clear from the results, however, that a better classification of the pupils within the grades would result in better composition work.

3. *Writing*.—Samples of the ordinary writing of the children in Grades III–VIII were taken, and these were scored by the Thorndike scale. The results of the test showed again that Salt Lake City ranks high compared with school systems where the test had been used, that the writing work was well up to the standard, and that the time involved was not unreasonably long. Median samples of the writing in each grade were reproduced in the report with the view to showing that the writing of the children in the schools did not offer the basis for the criticism of the school writing which the business men were wont to express.

4. *Reading*.—The new Courtis reading tests were used in testing the quality and quantity of the reading in a number of the schools, and these were supplemented by a number of personal judgments on the quality of the reading. While the reading test is recent and has not as yet been perfectly worked out, so that the members of the survey did not feel that the results were particularly valuable, yet the showing which the Salt Lake City schools made, indicated that the city ranked well in point of ability to read rapidly and remember what was read.

5. *Arithmetic*.—Two types of tests were made in arithmetic. For the first the Courtis standard tests in addition, subtraction, multiplication, and division were used, and the scoring was done in the manner provided for in the Courtis tests. The second test in arithmetic was one in reasoning, and for this the Stone reasoning tests were used. Compared with a number of other cities in which these same tests have been used, the schools of Salt Lake City stood high in the four fundamental operations. The city also stood well in the reasoning tests. Detailed tables and graphs were presented in the report to show the results by grades and by schools.

#### SUMMARY AND RECOMMENDATIONS

Sixty pages in the survey report are devoted to a detailed description of the tests made, and twenty-one tables and twelve drawings further illustrate the results. An attempt was made to draw from the results as shown certain conclusions and recommendations which would help the administrative authorities in the improvement of the schools. While one needs to read the entire chapter to get the full meaning of the conclusions and recommendations made, these may, nevertheless, be summarized as follows:

*Conclusions*.—1. Salt Lake City ranks high among cities of her class in each of the five studies in which tests were given.

2. In spelling, so large a percentage of children made a perfect score that full interpretation of the results is difficult. The city's average standing was 16 per cent above the standard.

3. In spelling, language, writing, and in the fundamentals of arithmetic, wide differences exist between the results shown for different schools.

4. The differences between grades are, with few exceptions, approximately what they should be.

5. The range of abilities in any given grade is entirely too great, as judged by all five of the tests.

6. Similarly, the range of abilities within a given class, again in all subjects tested, is far too great.

7. At least one-fourth more time is being given to spelling, and more than one-fourth more to arithmetic, than is justified in the light of the best knowledge on the subject.

*Recommendations.*—1. Spelling should not have more than 60 to 75 minutes per week, and arithmetic from 75 minutes in Grade II to 200 minutes in Grade VIII. A part of the surplus time from these two branches should be given to language work and part to other parts of the curriculum than the subjects dealt with here.

2. The only economical and pedagogical way of meeting the needs of the extremely dull and extremely bright pupils (perhaps from 4 to 10 per cent of each school class tested) is by a much larger use of ungraded rooms, to which the most skilful teachers should be assigned. It would be easy for all the larger schools of the city to find from 25 to 50 children who ought, for their own sakes and for the sakes of other children as well, to be placed in such rooms. This would provide an inestimable relief in all class work in the school. This is the most evident and the most important need which is brought to light by these tests.

3. The best and most constant supervision of this work is needed to secure the necessary readjustments. It should be added that, so long as the grade lines are stiffly maintained as the only basis for the classification of children, part of the value of expert supervision is nullified.

4. In addition to this, promotion by subjects ought to be a possibility more frequently made use of. When a fourth-grade child can read as well as a seventh-grade child he ought not to be kept in the fourth grade for reading just because he cannot leave his fourth-grade arithmetic.

5. Briefly, what the schools have achieved in general, they should now set themselves to achieve in particular.



## CHAPTER X

### READING

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Progress in the study of reading has been made since the report of this committee in 1915 chiefly through the opportunity supplied by the Cleveland survey to apply on a large scale the methods developed in previous studies. The Cleveland tests in reading fall into two fairly distinct groups. The first group was made with exercises selected from the readers commonly employed in the grades. In this group of tests the teachers of the whole city participated. The results show with clearness that teachers can conduct productive studies if a little supervision is provided, and that results secured by general studies of this type can be directly applied to ordinary school work. The second group of reading tests carried on in the Cleveland survey was made with standardized selections and demonstrates that a satisfactory degree of exactness can be attained even in so complex a subject as reading and that the methods of instruction in reading, especially in the upper grades, are in need of radical improvement.

The first tests in which all the teachers participated are described in the following directions sent to the teachers:

#### TESTS OF READING—CLEVELAND FOUNDATION SURVEY (May, 1915)

In order to make a study of reading, it is necessary to secure certain facts which are not ordinarily noted in everyday classroom work. Special methods will have to be adopted in order to secure these facts, but it is a fundamental mistake to think of these special recording methods as opposed in any way to the ordinary routine of classwork, or to think of them as replacing for either pupils or teacher the regular instruction. A recording device is good just in the degree in which it fits into the regular work and at the same time gives a series of accurate results on the particular point on which information is sought.

*Rates of Reading.*—All reading proceeds at some rate. Children in the same class differ in their rate of reading; children change in their rate of reading

as they go up through the school. It is desirable that we get some exact facts about these different rates, because rate is in itself important, because we find that rate and ability to understand are interdependent, and because rate is one of the symptoms by which we can readily measure the stage of development of the pupil.

*Interpretation and reproduction.*—Again, the power to reproduce is cultivated in all reading exercises. This power differs greatly in different children, and is affected by the kind of ideas presented in the reading matter. It is a more difficult problem to find out how much children understand and are able to reproduce than to determine the rate of reading, but we must carry our investigation far enough to determine, by studies of the power to reproduce, how far the teaching has been effective in cultivating the child's understanding.

*Measurement as related to instruction.*—Measurements of speed and power of interpretation will be worth collecting only when such measurements bring out the normal facts which are always present, but are for the most part unrecorded in reading exercises. Whenever asked to measure speed or power of interpretation, the teacher should be sure first of all that the process of measuring does not change the character of the exercise as a real class exercise. Have a normal lesson. Be sure in every case that the pupils get out of the exercise just as much instruction as though no recording of facts were going on, and follow the reading with the most productive instruction that can be given.

*Learning to record facts.*—The recording of facts presents certain difficulties. Usually a person who tries to record facts for the first time finds that he is distracted and inaccurate. The first principle which has to be laid down as applicable to all this work is therefore the following: Repeat each recording exercise several times until it becomes easy. Do not be discouraged if the record made the first time does not seem to go well. Furthermore, do not throw away the first record. It is worth keeping for purposes of comparison.

*Uniform survey of reading.*—This survey will aim to find out as much as possible about reading in the Cleveland schools. In order to make comparison easy the reading matter to be used for the final records of each type will be taken from the Jones Readers, which are in every school.

Teachers are urged to try the tests with other passages than these designated for use in all schools. The more frequently the test can be made with various kinds of material, the better prepared will the teachers be to make the final uniform test. Records should be kept of all tests made. The prescribed passages from the Jones Readers should be used on a given day in each building after sufficient preliminary practice to insure that the teachers know how to make the tests.

Throughout the preliminary practice and the final uniform test every reading exercise should be made a part of the regular instruction of the class.

*Measuring the rate of oral reading.*—The simplest measurement under the ordinary conditions of class work is probably a measurement of the rate of oral reading. This record can be made in any ordinary reading exercise. Do not let the children know that measuring is going on. Have them read as usual, but let the teacher have a watch and a pencil at hand. When a child begins to read, record his name and note the second at which he starts the paragraph. At the end of one minute put a mark in the book showing how much the child read. Let him read on without interruption to the end of the paragraph, as he would in any reading exercise. Make whatever comments or ask whatever questions would be asked in an ordinary reading lesson and then go on with a second child. After class count up the lines read by each member of the class in 60 seconds and tabulate the records. It will be found that there are certain differences in rate. Later we shall learn more about each child when we measure his rate of silent reading and when we measure his power of reproduction.

*How the survey will use records.*—By way of anticipation of the kind of use which will be made at the survey office of these results, it may be pointed out that a comparison will be made of different grades and of the records from various parts of the city. It should be stated explicitly that good reading cannot be judged by speed alone. A very rapid rate of reading in a second grade, for example, would show that the exercise is not a reading exercise at all, but a memory exercise. Too rapid reading in an upper grade would show lack of clear enunciation. No second grade and no eighth grade should stand out of its class, either above or below. It is possible, therefore, through a general comparative study to check up any single set of figures by the general results. If a single set of figures is to be useful, it should reflect the facts faithfully. Good records are faithful records, not exceptional records.

It may be appropriate to remark in this connection that these records are not to be used to the advantage or disadvantage of any individual. The value of the reading matter, the stage of development of the children, and many other general factors will be brought out by this broad survey. The method will also be useful in directing the efforts of individual teachers. The latter advantage is one which the survey ought to leave behind, but it does not fall within the scope of the survey to pass on individuals.

*Measuring the rate of silent reading.*—The second measurement is designed to bring out the facts regarding silent reading. All schools use silent reading in the requirement that pupils study geographies and histories, but too often

silent reading is lost sight of as a special problem for the reading-teacher. It may be difficult, because such work has not been emphasized, to have an exercise in silent reading which shall not impress the children as unusual. It is especially urged, therefore, that this part of the study be preceded and followed in every case by some real instruction and questioning. For example, when a passage has been read silently, as will be directed below, let the teacher immediately verify the reports made by various children by asking them about all parts of the passage, especially that which they report that they read last. Repeat the measurement and the questioning with both familiar and unfamiliar matter until the pupils come to realize what a silent-reading exercise really is. Furthermore, do not give any direction such as "repeat each word to yourself carefully," or otherwise try to influence the children to read silently by any fixed or prescribed method.

What is wanted is a clear record of how fast the child reads to himself in a normal way without skipping on the one hand, or without unduly careful looking at each individual word on the other.

It would be possible to take individual records of the rate of silent reading similar to those provided for in the section above on oral tests, but this is probably unnecessary, since the class as a whole can be measured without serious difficulties. Start the class off all together. In order to do this, let the teacher read aloud to the whole class in a normal way some part of the page immediately preceding that which is to be used for the test. When all come to the turning of the page, let the teacher stop reading and note the exact time. Let the children go on in accordance with a prearranged plan, each reading to himself, with the understanding that there are going to be questions asked about what he has read. At the end of a minute have each child close his book and report by reproducing on paper the last line which he read. He will not be able in most cases to report the line in exact form, but the teacher can judge by means of the written record how far the pupil has read. Now have some discussion of the passages so as to make sure that all read what they reported and that they read without skipping. After school, record the number of lines read by each. Try this several times.

A very good exercise for the pupils can be made of the requirement that they count the lines read, but their count should in each case be verified by the written record mentioned above.

*Later tests.*—Following these two kinds of tests will come others on the power of interpretation of the passages read. The detailed directions for these interpretation tests will be given out later.

*Uniform test in oral reading.*—After several preliminary tests of oral reading have been made by the methods described, and the results entered on the tabulating sheet, the uniform test should be given. In order that the pupils



of a given grade throughout the city may read the same material, the following selections have been chosen from the Jones Readers for this test:

Grade	Book	Selections	Pages
2A .....	II .....	Nathan and the Bear.....	94-100
		Ruff's First Adventure.....	118-123
3A .....	III .....	Peter Johnson's Boots.....	57- 60
		Rosamond and the Purple Jar...	150-153
4A .....	IV .....	Prof. Frog's Lecture.....	116-126
		Queen Alice.....	129-136
5A .....	V .....	Golden Touch.....	29- 39
		Moses at the Fair.....	69- 71
6A .....	VI .....	A Gallop of Three.....	13- 17
		A Hunting of the Deer.....	47- 53
7A .....	VII .....	An Old-Fashioned Snow Storm...	63- 66
		A Cellar in Siberia.....	77- 80
		Charley.....	20- 24
8A .....	VII .....	Surrender of Granada.....	161-167
		Destruction of Pompeii.....	176-182

At the conclusion of this test the results should be entered on a new tabulating sheet.

*Uniform test in silent reading.*—After several preliminary tests of silent reading have been made by the methods described and the results entered on the tabulating sheet, the uniform test should be given. The same tests will be given in each grade throughout the city. They will be taken from the Jones Readers, as follows:

Grade	Book	Preliminary Page	Test Pages
2A .....	II .....	101 .....	102-103
3A .....	III .....	97 .....	98- 99
4A .....	IV .....	61 .....	62- 63
5A .....	V .....	47 .....	48- 49
6A .....	VI .....	63 .....	64- 66
7A .....	VII .....	73 .....	64- 66
8A .....	VII .....	247 .....	248-249

At the conclusion of this test the results should be entered on the tabulating sheet for the results of the uniform test in oral reading.

*What the measurements show.*—Teachers will note in their own results the following facts:

1. Children differ radically.
2. Passages differ in difficulty, but the various children in each class are likely to show fairly uniform relative standings whatever the character of the passages. Especially may it be noted that unfamiliar passages are sometimes easier than familiar passages.
3. The rates of silent and oral reading differ.



The directions as to procedure have been for the most part given in the foregoing discussion. The following details may be added:

In counting, be sure that a line which is shortened by a picture is counted as a part line.

At the end of a paragraph count all lines that are half-lines or more as though they were full lines. If such a line is less than a half-line, neglect it.

Be sure that you test in all cases for recognition of meaning, so that the pupils will not be tempted to skip or make extravagant reports.

Make all tests frequently enough so that you have confidence in your reports.

It is suggested that from the beginning each teacher try some written tests of the power to reproduce passages, so that when that kind of work begins for the survey there will be a clear notion of the precautions which are necessary.

Some of the typical results of these tests may be presented. First, the now well-known difference between the rate of silent reading and the rate of oral reading was brought to the attention of teachers by the results which they obtained. These results are reported in Table I.

TABLE I

NUMBER OF LINES READ ORALLY AND SILENTLY IN ONE MINUTE BY CHILDREN IN THE VARIOUS GRADES OF 43 CLEVELAND SCHOOLS

Grades	Lines Read Orally	Lines Read Silently
II.....	13	16
III.....	16	22
IV.....	14	21
V.....	15	20
VI.....	16	24
VII.....	16	21
VIII.....	16	21

No effort should be made to compare the results of successive grades with each other, because the length of the lines in different readers is different and the content of the passages is of varying difficulty. Even so, it is evident that children read more rapidly when they are free from the necessity of pronouncing words. The fact that there is not greater difference in the upper grades is undoubtedly due to the fact that school training emphasizes almost exclusively oral reading.

Fuller details of this contrast between oral and silent reading may be seen in Table II, which shows the results in full for the sixth grades of five schools.

Especially significant is the fact that the deviations from the medians are comparatively much smaller in oral reading than in silent reading. This means that children in a given grade are more alike in their abilities to read orally than in their abilities to read silently. This is explained by the fact that the limits of speed in oral reading are determined in part by the limits of the purely physiological process of articulation. All children in the sixth grade approach this physiological limit of speed in articulation. In silent reading, on the other hand, the widest differences are possible. That wide differences do appear is clearly shown by comparing the two columns in Table II marked "median deviation."

TABLE II

NUMBER OF LINES READ PER MINUTE IN THE SIXTH GRADES OF FIVE SCHOOLS

NAME OF SCHOOL	No. OF PUPILS	LINES READ ORALLY				LINES READ SILENTLY			
		Lowest Pupil's Record	Highest Pupil's Record	Median Record	Median Deviation	Lowest Pupil's Record	Highest Pupil's Record	Median Record	Median Deviation
Addison.....	16	12	24	19	2.3	21	41	28	5.7
	16	11	23	14	3.2	15	32	21	4.2
Alabama.....	13	10	18	15	1.5	13	29	24	3.2
Bolton.....	35	9	20	16	2.0	8	44	15	9.5
	22	7	19	23	2.2	14	50	37	7.7
Boulevard.....	28	11	19	13	1.5	8	30	19	4.0
Brownell.....	32	6	24	14	3.0	15	55	22	6.0

The second set of tests—that is, the tests which employed, not the common passages from the readers in the hands of the pupils, but a series of selected and standardized passages—represents an advance in technique above the tests made by the whole system. The passages were standardized by Mr. William S. Gray. Without entering into the details of Mr. Gray's method, it may be stated in general terms that passages were selected by teachers and were then graded according to the results obtained after use with children of various school systems and various grades.

It is quite impossible to review in full the results obtained by the use of these standardized passages. Perhaps the most significant single result appeared in the fact that the more rapid the pupil's silent reading,

the higher his ability to reproduce what he has read. Some of the evidence establishing this conclusion is presented in Table III. Three passages were employed in this test, one by Grades II-IV, a second by Grades V and VI, the third by Grades VII and VIII. The table should be read as follows: In the second grade those pupils who read 100 words in from 102 to 98 seconds, inclusive, made an average quality grade of 17. Those who read 100 words in the shorter period from 92 to 88 seconds, inclusive, made an average quality record of 19. The table is based on data from 1,831 pupils in the Cleveland schools. The full significance

TABLE III

TABLE SHOWING RELATION OF SPEED AND QUALITY IN SILENT READING  
(Based on data from 1,831 pupils in Cleveland, Ohio)

Grade	100 Words in 100 Seconds or 1 Word per Second	100 Words in 90 Seconds or 1.1 Words per Second	100 Words in 80 Seconds or 1.25 Words per Second	100 Words in 70 Seconds or 1.42 Words per Second	100 Words in 60 Seconds or 1.62 Words per Second	100 Words in 50 Seconds or 2 Words per Second	100 Words in 40 Seconds or 2.5 Words per Second	100 Words in 30 Seconds or 3.3 Words per Second	100 Words in 20 Seconds or 5 Words per Second	100 Words in 16-Seconds or 6.5+ Words per Second
II.....	17	19	20	23	24	24	25	31	30	36
III.....	19	21	24	29	28	28	30	34	41	28
IV.....				12	15	15	17	22	22	14
V.....				13	20	20	22	26	24	33
VI.....				19	27	28	22	28	30	23
VII.....					10	17	19	20	26	28
VIII.....						19	21	25	29	18

of the table is brought out by reading horizontally along the line of each of the grades. Thus, for the second grade the score for quality improves steadily from 17 to 36 as the speed increases. For the third grade the score for quality improves steadily until the last stage, where there is an exceptional drop. It will be seen that in almost every case increase in speed is paralleled by improvement in quality.

The significance of this result for practical class work is at once apparent. Methods which will promote fluent, rapid reading will contribute in general to clear understanding and increase in power of interpretation.

The foregoing brief account of the results of the Cleveland survey will serve to show something of the character of the methods and outcome of the tests. More significant than any of the figures which can be

set down in tables, however, is the fact that these results can be used to improve the teaching of reading. This practical value of the tests can be made clear by referring to three distinct applications of the results in Cleveland which will be helpful.

First, the teachers are made aware by the tests which they themselves conducted of the importance of cultivating silent reading by methods different from those employed in oral reading exercises. Books on methods are full of advice on the teaching of oral reading, but they pass silent reading with a casual mention. Yet silent reading is the only form of reading commonly employed in later life. Silent reading is necessary for the pupil who studies geography or history or any other subject out of a textbook. It is accordingly important that the distinction be impressed on teachers.

Secondly, the methods of teaching generally employed in the schools tend to make pupils slow in their reading. It is very important that teachers learn from a comparison of their own pupils that those children who learn to be fluent by personal efforts are also the pupils who can reproduce most efficiently what they have read. This fact will serve to check all of the criticism which is sometimes heard against schools which aim to cultivate rapid methods of mental work. Speed is, within reasonable limits, a desirable quality. Speed in silent reading is distinctly a virtue.

Thirdly, there is the broad, general teaching of these tests. They show that exact, quantitative studies are highly useful in directing all kinds of school work. The arithmetic tests which have been so productively worked out by Courtis are accepted by teachers as naturally permitting a high degree of quantitative accuracy. Writing and spelling are thought of as readily reducible to quantitative grades because of their relative simplicity. When, however, exact statements can be made regarding reading, the central subject of the elementary course has been reached, and the value of exact investigations can be demonstrated more fully than in any other subject.

This final outcome is of such importance to schools in general that a chapter of this report has properly been devoted to a paper by a practical superintendent, Mr. Oberholtzer, setting forth his experience in conducting a quantitative study of reading.

## CHAPTER XI

### STUDIES BY THE BUREAU OF RESEARCH AND EFFICIENCY OF KANSAS CITY, MISSOURI

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GEORGE MELCHER

Director of the Bureau of Research and Efficiency, Kansas City, Missouri

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While bureaus of educational standards and measurements (research and efficiency) are engaged for the most part in applying to school work the objective measures that have been established, yet these bureaus are not standardized and no two of them are proceeding in the same way. However, many problems are common to all of them. Most of them co-operate with the superintendents of their school systems in the analysis of school statistics (some handling all the school statistics); they direct various forms of educational measurements, tabulate the results, and furnish the summaries and conclusions reached to superintendents, supervisors, or principals, to be used in improving educational practice. They also study the cost of various items of school expenditure and establish standards in school costs; they conduct various forms of school inquiries; they make careful scientific studies of any problem of school supervision or school administration. These bureaus are attacking the herculean task of substituting fact for opinion in school practice. For generations our schools have been conducted along the lines laid down by opinion and precedent. All other forms of business of great magnitude that spend vast sums of money, and affect the welfare of thousands of people, are being organized more and more in accordance with well-established principles, based on fact. Education is the greatest business in which the people are engaged, and this business affects more vitally than any other business the life of every person. It is right, then, that the people should demand of this enormous business enterprise accounts, both educational and financial, as complete, systematic, and accurate as any other business furnishes. The people should know what results they are getting for the vast outlay of money they are making.

During the past year the Bureau of Research and Efficiency of Kansas City has studied the following problems: (1) overageness and



its causes; (2) non-promotion and withdrawals and their causes; (3) opportunity for individual progress in schools; (4) comparative study of school elimination and school persistence for the past twenty-five years; (5) length of time required to complete the elementary-school course; (6) the efficiency of school work in (a) spelling, (b) handwriting, (c) fundamental operations in arithmetic, (d) accurate copying; (7) the cost of heating, lighting, water, janitor service, etc.; (8) grading and distribution of grades in the high schools; (9) revision of the reports and records of the school system so as to make them of greater educational significance; (10) exceptional children and their needs; also (11) several minor problems.

The work of the Bureau can best be illustrated by extracts from a few of the studies made. The following is part of a study showing method of attack on cost of heating.

#### A. COST OF FUEL PER PUPIL IN DAILY ATTENDANCE

The following table gives the 50 largest cities in the United States, arranged in the order of the cost of fuel per pupil in daily attendance during the school year 1912-13:

1. New Orleans.....	\$0.37	26. Scranton.....	1.34
2. Richmond.....	0.37	27. Pittsburgh.....	1.35
3. San Francisco.....	0.40	28. Fall River.....	1.40
4. Nashville.....	0.46	29. Boston.....	1.41
5. Los Angeles.....	0.46	30. St. Paul.....	1.43
6. Birmingham.....	0.48	31. Providence.....	1.45
7. Atlanta.....	0.58	32. Minneapolis.....	1.49
8. Oakland.....	0.62	33. Toledo.....	1.52
9. Memphis.....	0.66	34. Philadelphia.....	1.52
10. Louisville.....	0.69	35. Buffalo.....	1.54
11. Paterson.....	0.71	36. Spokane.....	1.58
12. St. Louis.....	0.80	37. Jersey City.....	1.60
13. Newark.....	0.83	38. Columbus.....	1.61
14. Baltimore.....	0.92	39. Denver.....	1.67
15. New York City.....	0.96	40. Portland.....	1.68
16. Dayton.....	1.00	41. Washington.....	1.70
17. Bridgeport.....	1.03	42. Chicago.....	1.71
18. Detroit.....	1.09	43. Worcester.....	1.83
19. Cleveland.....	1.12	44. New Haven.....	1.84
20. Seattle.....	1.21	45. <i>Kansas City, Mo.</i> .....	1.96
21. Cincinnati.....	1.22	46. Omaha.....	2.10
22. Milwaukee.....	1.24	47. Syracuse.....	2.11
23. Cambridge.....	1.27	48. Rochester.....	2.27
24. Grand Rapids.....	1.30	49. Albany.....	2.37
25. Indianapolis.....	1.31	50. Lowell.....	2.70

From the foregoing tabulation it is seen that in 1912-13 only five cities in the United States paid more per pupil for fuel than did Kansas City, Missouri, and that only one of these cities was in the Central West. Investigation of coal prices indicates that the prices of coal in Kansas City, Missouri, are relatively high. However, after allowance is made for the higher price of coal, it seems probable that the cost per pupil for fuel in Kansas City, Missouri, is 10-20 per cent higher than in cities that are able to secure coal at about the same prices as are paid in Kansas City. In compiling the foregoing figures, the fuel used in the library building and library branches was deducted before making the averages. No deduction, however, has been made for coal used by janitors. In most cities coal is not furnished the janitors by the school district. The coal used by the janitors should not amount to more than 5 per cent of the bill. Thus it is seen that when allowance is made for the janitors' coal the cost of fuel is still relatively high.

It is fair to Kansas City to note that in recent years this school district has erected a large number of new school buildings, containing large schoolrooms, spacious hallways, gymnasiums, etc. Such buildings equipped with modern ventilating systems and other modern conveniences are necessarily expensive to heat.

#### COST OF COAL PER PUPIL IN DAILY ATTENDANCE

(Cities in Missouri, Kansas, Nebraska, and Iowa)

	1910-11	1911-12	1912-13	1913-14
MISSOURI				
Springfield.....	\$0.67	\$0.78	\$0.70	\$0.79
Joplin.....		.79	.73	.76
St. Louis.....	.81	.87	.80	.76
St. Joseph.....		1.78	1.83	1.69
Kansas City.....	1.65	1.81	1.96	1.77
KANSAS				
Kansas City.....	1.34	1.30	1.48	.....
Topeka.....	1.45	1.82	1.53	.....
NEBRASKA				
Omaha.....	.....	1.85	2.09	.....
IOWA				
Council Bluffs.....	.....	1.06	1.04	.....
Sioux City.....	.....	1.56	1.53	.....
Davenport.....	.....	1.71	1.55	.....
Des Moines.....	.....	1.86	1.72	.....
Cedar Rapids.....	1.68	2.12	1.49	.....

COST OF COAL PER PUPIL IN DAILY ATTENDANCE IN EACH SCHOOL BUILDING  
IN KANSAS CITY, MISSOURI

1. Kensington.....	\$0.735	S	40. Wendell Phillips.....	1.636	H
2. Sixty-first Street.....	0.783	S	41. Bristol.....	1.662	H
3. Askew.....	0.838	S	42. Linwood.....	1.684	O
4. Milton Moore.....	0.840	S	43. G. B. Longan.....	1.686	O
5. Henry C. Kumpf.....	0.883	S	44. Karnes.....	1.712	H
6. Irving.....	0.944	O	45. Penn.....	1.734	S
7. Shiloh.....	0.956	S	46. Thacher.....	1.753	O
8. Jefferson.....	0.964	H	47. Blenheim.....	1.80	S
9. Manchester.....	1.019	S	48. Bruce.....	1.825	S
10. Woodland.....	1.023	O	49. Booker Washington...	1.861	S
11. Swope.....	1.024	S	50. Wheatley.....	1.897	S
12. Hale H. Cook.....	1.049	S	51. Lykins.....	1.907	H
13. Emerson.....	1.058	S	52. Attucks.....	1.913	H
14. Washington.....	1.058	O	53. Mount Washington...	1.915	H
15. Hamilton.....	1.101	O	54. Bancroft.....	1.944	O
16. Scarritt.....	1.102	O	55. Norman.....	1.962	O
17. Switzer.....	1.114	O	56. S. B. Ladd.....	1.963	H
18. Horace Mann.....	1.136	O	57. Douglass.....	1.972	S
19. Benton.....	1.147	O	58. Garrison.....	2.084	H
20. Greenwood.....	1.155	O	59. Adams.....	2.086	H
21. Frances Willard.....	1.178	S	60. Webster.....	2.110	H
22. Troost Avenue.....	1.184	H	61. Rollins.....	2.111	O
23. Lincoln.....	1.203	O	62. Swinney.....	2.135	S
24. Humboldt.....	1.212	O	63. Longfellow.....	2.146	H
25. Morse.....	1.215	O	64. Blue Valley.....	2.164	S
26. William Cullen Bryant	1.254	S	65. Jackson.....	2.204	S
27. Martin.....	1.277	S	66. Special.....	2.262	S
28. Whittier.....	1.311	O	67. Marlborough.....	2.337	S
29. James.....	1.323	O	68. Seven Oaks.....	2.515	S
30. Hyde Park.....	1.357	O	69. McCoy.....	2.817	S
31. Fairmount.....	1.362	S	70. Sumner.....	2.848	S
32. Lowell.....	1.384	O	71. Graceland.....	2.851	S
33. Van Horn.....	1.409	H	72. Benjamin Harrison...	2.896	S
34. Faxon.....	1.419	O	73. Clay.....	2.954	H
35. Yeager.....	1.424	O	74. J. S. Chick.....	2.980	S
36. Franklin.....	1.475	H	75. S. O. Allen.....	3.426	S
37. Ashland.....	1.480	O	76. E. C. White.....	3.454	S
38. Allen.....	1.536	O	77. Lathrop.....	3.891	H
39. Garfield.....	1.600	O	78. Madison.....	4.596	H
Manual Training High....	1.905	O	Central High.....	4.079	O
Westport High.....	2.251	O	Northeast High.....	4.904	S
Lincoln High.....	2.694	O			

O=oil.

S=soft coal (bituminous).

H=hard coal (anthracite or semi-anthracite).

From the table on p. 122 it is seen that the cost per pupil for coal in Kansas City, Missouri, averages higher than the cost in any other city in

this group of states except the city of Omaha. The average cost is more than 20 per cent greater than in Kansas City, Kansas, more than 10 per cent greater than in Topeka, Kansas, and more than double the cost in St. Louis, Missouri. A large part of this latter difference is accounted for by the fact that St. Louis buys the best grade of Illinois lump coal (bituminous) at a very low rate. This year St. Louis has contracted for its coal at \$1.91 $\frac{3}{4}$  per ton, whereas Cherokee coal costs the Kansas City school district \$3.54 per ton and is not so good a quality of coal as the Illinois lump. While this difference in the price and quality of the coal will account for a large part of the difference in the cost in St. Louis and Kansas City, it does not account for all of it. It would seem from these figures that the cost in Kansas City is from 10 to 20 per cent higher relatively than the cost in St. Louis or than the cost in the neighboring towns in Kansas.

*Group I.*—The largest group of school buildings is heated by steam hot-blast. There are 28 schools in this group. The lowest cost in this group was \$1.102 per pupil in the Scarritt School, and the highest cost was \$3.454 per pupil in the E. C. White School. It would seem that it

TWENTY-EIGHT BUILDINGS HEATED BY STEAM HOT-BLAST AND THE COST  
PER PUPIL

Scarritt.....	\$1.102	Whittier.....	1.311
Switzer.....	1.114	James.....	\$1.323
Horace Mann.....	1.136	Hyde Park.....	1.357
Benton.....	1.147	Van Horn.....	1.409
Greenwood.....	1.155	Faxon.....	1.419
Humboldt.....	1.212	Franklin.....	1.475
Morse.....	1.215	Ashland.....	1.480

		Percentage above Median Cost			Percentage above Median Cost
Allen . . . . .	\$1.536	2	Norman . . . . .	\$1.962	30
Garfield . . . . .	1.600	6	S. B. Ladd . . . . .	1.963	30
Linwood . . . . .	1.684	11	Rollins . . . . .	2.111	40
G. B. Longan . . . . .	1.686	11	Benjamin Harrison	2.896	92
Thacher . . . . .	1.753	16	*Clay . . . . .	2.954	96
Lykins . . . . .	1.907	27	E. C. White . . . . .	3.454	130
Attucks . . . . .	1.913	27	Median cost . . . .	1.508	...
Bancroft . . . . .	1.944	29			

\* Investigation has developed the fact that in this new 18-room building only 11 rooms were occupied, but that all 18 were kept heated all winter. The heat should have been cut off from 7 of these rooms and thus more than one-third of the cost saved.

should not cost more than \$1.51 per pupil to heat these buildings, since one-half of the buildings were heated for less than that cost. Note that seven buildings in this group were heated for less than \$1.22 per pupil. This might indicate that \$1.20 to \$1.25 per pupil is a fair cost for heating such buildings when the firing is properly managed. No school in this group has less than eight rooms. The Faxon and the Clay buildings are both new and built on the same plan.

*Group II.*—The second largest group of school buildings is heated by direct steam. There are 16 in this group. The lowest cost in this group is the Irving, \$0.944 per pupil, and the highest cost is the Longfellow, \$2.146 per pupil. The median cost is \$1.331. However, it will be noted that 6 of this group are heated for less than \$1.06. It would seem from the very nature of the case that direct steam heat should be cheaper than steam hot-blast. Hence it would seem that \$1.05 to \$1.10 per pupil is a fair cost for such heat.

#### SIXTEEN BUILDINGS HEATED BY DIRECT STEAM

Irving.....	\$0.944	Yeager.....	\$1.424
Jefferson.....	0.964	Phillips.....	1.636
Woodland.....	1.023	Karnes.....	1.712
Emerson.....	1.058	Garrison.....	2.084
Washington.....	1.058	Adams.....	2.086
Hamilton.....	1.101	Webster.....	2.110
Lincoln.....	1.203	*Longfellow.....	2.146
Martin.....	1.277	Median cost.....	1.331
Lowell.....	1.384		

\* An incompetent janitor is named as the explanation of the high cost in the Longfellow.

Three other groups of elementary school buildings were studied in a similar manner.

#### *Group VI. High Schools.*—

Manual Training High.....	\$1.905	Central High.....	4.079
Westport High.....	2.251	Northeast High.....	4.904
Lincoln High.....	2.694		

The cost here is necessarily greater than in the elementary schools, as more cubic feet of space per pupil must be heated. However, in some of these schools the cost seems excessive, especially in the Northeast High School, with a cost of \$4.90 per pupil. The operation of the air-washer adds something to the cost of the heating in this building. The



fact that the building stands in the open and is fully exposed also adds to the cost. After a reasonable allowance is made for this additional cost, the still excessive cost would indicate one of two things: incorrect and wasteful methods of firing or improper fire grates or fire boxes causing excessive waste of fuel. A saving of \$1,000 to \$2,000 on the coal bill of this building would seem possible. It is impossible at this season of the year, August, to determine the real cause of this high cost. However, this may be worked out during the next school year.

#### GENERAL CONCLUSION

It seems evident that by proper attention on the part of the janitors to correct methods of firing and of economizing fuel an annual saving of from \$5,000 to \$10,000 could be made in the district.

The cost per 1,000 cubic feet to be heated may be fairer than the cost for each pupil, but the dimensions of the buildings were not available for this study.

*Note 1.*—Three kinds of fuel are used—oil, soft coal, and hard coal. Some allowance must be made for varying cost of the kinds of fuel.

*Note 2.*—In 1915-16, the Central High School will be opened. This building is very similar to the Northeast Building and will be heated by slack fed into the furnace by mechanical stokers. This will enable an accurate comparison of the cost of heating in the two buildings to be made. In the Northeast High School soft coal is used; oil is used in all the other high-school buildings.

Such studies as this show conclusively the need of standards for the cost of heating, lighting, water, supplies, janitor service, etc.

#### B. STUDY OF SCHOOL PROGRESS

The following study was made of the Kansas City, Missouri, ward-school graduates of June, 1915.

Just before the close of the school year the following "Individual School History" blank was sent to each member of the graduating class by the Bureau of Research and Efficiency:

## INDIVIDUAL SCHOOL HISTORY

## SEVENTH-GRADE PUPILS

1. Name.....Street Address.....  
(Write surname first)
2. When were you born? Year....., Month....., Day.....
3. Where were you born?.....
4. What will be your age June 11, 1915? Years...., Months...., Days....
5. Did you attend kindergarten?..... When?..... Where?.....  
How many months?.....
6. In what year and month did you first enter school (not kindergarten)?  
Year....., Month.....
7. Where did you first enter school?.....In what grade?.....
8. How old were you when you first entered school (not kindergarten)?  
Years....., Months.....
9. Have you attended school a part or all of each school year since you entered  
school?.....
10. How many school years or parts of school years have you attended school?  
.....
11. Have you ever missed as much as five (or more) consecutive months of  
school? List below each such absence from school:  
When (year)? Number of months? Why? In what grade?  
a.....  
b.....  
c.....
12. When did you first enter school in Kansas City?.....  
In what grade?.....
13. Have you at any time repeated a grade or a class? If so, what grades or  
classes? .....
14. Have you at any time skipped a grade or class? If so, what grades or  
classes?.....

Careful directions were sent as to the method that should be pursued and the care that should be exercised in answering the questions, in order that the answers might be as accurate as possible; though the children depended upon their own memory and that of their parents, it is felt that in most respects the answers are fairly accurate.

It will be noticed that many of the questions are so put that the answers serve as a check upon each other. The papers were carefully

examined before the study was made, the answers compared and checked, and corrections made wherever it was evident an error had been made.

In this study we had in view the following problems: (1) to determine the time required to finish in the seven-year system which is in force in the Kansas City schools (boys and girls were kept separate in the study); (2) since about one-half of this class had a year's work in the kindergarten before entering the grades, a secondary problem was to determine the length of time required to finish by kindergarten children and also by non-kindergarten children (those who had not had work in kindergarten) and to compare the progress of the two groups in the matter of time required to finish; (3) some secondary problems that are omitted here.

It is felt that the first problem is of special interest because Kansas City has only seven years in the elementary-school course.

All children who entered the Kansas City schools after 1910 were excluded from this study in order that all children included might be placed upon an equal footing in regard to the school system. In doing this it was assumed that the difference in the first two years' work would not be very great, whether in a seven-year or an eight-year system, and that a child having had two years' work outside of Kansas City would usually enter the third grade upon coming to Kansas City. When a pupil was absent more than one-half the year, that year was not counted as a school year for him. Of the 2,084 white graduates in 1915, 378 were excluded and 1,706 were used for this study.

TABLE I  
NUMBER OF PUPILS STUDIED, INCLUDING KINDERGARTEN  
AND NON-KINDERGARTEN

	Boys	Girls	Total
Number of pupils studied.....	847	859	1,706
Number of kindergarten pupils.....	417	406	823
Number of non-kindergarten pupils...	430	453	883

Table II shows that this class was about equally divided between seven and eight years in time required to finish; that a small number, 96, required less than seven years, and 239 required more than eight

years. Five pupils finished in five years. Four of these were non-kindergarten pupils and were overage at entrance into school.

TABLE II  
NUMBER FINISHING AND YEARS REQUIRED

	NUMBER OF YEARS TO FINISH								Total
	12	11	10	9	8	7	6	5	
Number of boys, non-kindergarten	0	5	12	73	192	133	12	3	430
Number of girls, non-kindergarten	1	0	14	50	206	159	22	1	453
Number of boys, with kindergarten	0	0	8	48	145	189	26	1	417
Number of girls, with kindergarten	0	0	5	23	142	205	31	0	406
Total.....	1	5	39	194	685	686	91	5	1,706
Percentage, total.....	0.05	0.29	2.28	11.37	40.21	40.15	5.33	0.29	100
Percentage, non-kindergarten boys and girls.....	0.12	0.57	2.95	13.93	45.07	33.07	3.85	0.45	100
Percentage, kindergarten boys and girls.....	0.00	0.00	1.58	8.63	34.87	47.87	6.92	0.12	100

Table III shows that the class as a whole required about seven and two-thirds years to finish the course, a saving of about 0.75 of a year over the eight-year system, since the average time required in most eight-grade systems is about 8.4 years. The time required for the girls is slightly less than that for the boys.

TABLE III	
AVERAGE TIME REQUIRED	Years
Average time for all boys and girls.....	7.65
Average time for all boys.....	7.72
Average time for all girls.....	7.58

Table IV, which is a comparison of kindergarten and non-kindergarten children, shows that in the matter of time required to

TABLE IV  
COMPARISON OF TIME REQUIRED BY KINDERGARTEN AND NON-KINDERGARTEN CHILDREN

	Non-Kindergarten	Kindergarten
Average time required, boys and girls...	7.80	7.50.
Average time required, boys.....	7.87	7.56
Average time required, girls.....	7.72	7.42

finish the kindergarten children have an advantage of about three-tenths of a year over the non-kindergarten children. The kindergarten girls also finish in less time than the kindergarten boys. An average of only 7.42 years was required by the kindergarten girls.

Table V is another comparison of the time required to finish. In making this study, the necessity for a system of cumulative records whereby the advancement of a child through the grades can be traced accurately became clearly evident.

TABLE V  
TIME REQUIRED TO FINISH

	7 Years or Less	8 Years or More	Total
All, boys and girls.....	782	924	1,706
All, kindergarten boys and girls	452	371	823
All, non-kindergarten boys and girls.....	330	553	883
Kindergarten boys.....	216	201	417
Kindergarten girls.....	236	170	406
Non-kindergarten boys.....	148	282	430
Non-kindergarten girls.....	182	271	453

### C. OPPORTUNITY OF INDIVIDUALS

The following summaries taken from the reports on double promotions, special promotions, and special demotions give an insight into the chance that the individual will have his special needs met and that he will be considered apart from the mass or group.

TABLE VI  
DOUBLE PROMOTIONS DURING THE SECOND THIRTEEN WEEKS  
OF THE YEAR 1914-15

First grade.....	22	Fifth grade.....	9
Second grade.....	18	Sixth grade.....	6
Third grade.....	18	Seventh grade.....	1
Fourth grade.....	14	Total.....	88



Combining the 88, the 436, and the 420 cases of Tables VI, VII, VIII, we have only 944, or less than 3 per cent of the elementary-school enrolment, that received special promotions, demotions, or double promotions during one-third of last year. Are there not more pupils needing this special attention? From Table VII it is to be noted that it is two and one-half times easier to secure a special promotion in the same room than to a higher class in another room (315 were promoted within rooms, and only 121 to other rooms). It would appear that the barrier between rooms must be somewhat greater than between classes in the same room, though such a circumstance clearly ought not to operate to limit the child's opportunity.

TABLE VII  
SPECIAL PROMOTIONS TO HIGHER CLASSES

	In Another Room	In Same Room
First grade.....	52	72
Second grade.....	21	57
Third grade.....	20	59
Fourth grade.....	6	42
Fifth grade.....	15	62
Sixth grade.....	7	19
Seventh grade.....	0	4
Total.....	121	315

TABLE VIII  
SPECIAL DEMOTIONS TO LOWER CLASSES

	In Another Room	In Same Room
First grade.....	60	70
Second grade.....	28	29
Third grade.....	38	34
Fourth grade.....	10	24
Fifth grade.....	22	32
Sixth grade.....	17	34
Seventh grade.....	11	11
Total.....	186	234

While these summaries indicate that nearly all the pupils of the schools are moved forward in mass, it is very probable that the oppor-

tunity for individual adjustment is somewhat greater than is here indicated, for two reasons: First, the form of report used was new and in several cases it was evident that errors had been made, and the reports were returned for correction. However, in other cases the reports may not have been understood and errors may have been made. Secondly, the most probable form of error would be a failure to report special promotions and demotions by oversight or because of failure to keep a record of all such cases.

*While the majority of pupils are average pupils and should move in mass, there is a considerable number of especially slow pupils and also of especially bright pupils that should not be sacrificed to mass movement.*

It is very comforting to note that the figures given above show 16 more special promotions than special demotions. This means that the bright children are being given a chance. The bright children need special opportunities for advancement as well as the slow children.

The problem of meeting the needs of the individual pupil in city-school systems is still an unsolved one. It baffles both teachers and school administrators. One forward step has been made in that the problem has been recognized. For years teachers and school superintendents refused to admit the existence of such a problem. Some progress is being made in the solution of the problem through supervised study hours, special-help periods, more individual instruction, and less mass teaching.

#### D. EFFICIENCY OF SCHOOL WORK

In measuring the efficiency of teaching, the median results for the entire city were computed. These results were furnished to each principal and thus it was possible for a principal to compare each room in his building with the city medians and determine where added emphasis was needed or where improved methods were needed. In handwriting a test was made and the following directions were given the pupils in October:

#### PUBLIC SCHOOLS, KANSAS CITY, MISSOURI

##### PUPIL'S DIRECTION

Write as well as you can at your usual speed the following stanza. Write the stanza again and again until I say "Stop." At the command, stop at

once, even if in the middle of a letter. Use a line of paper for each line of stanza. Use no punctuation marks.

Speak the truth  
In the end it shall appear  
Truth is best in age and youth

The teachers and principals were directed to have each pupil read this stanza twice before beginning to write, to have the pupils write exactly two minutes, and to have no writing on the papers except the stanza—no name, no grade, no school, and no number. The samples in each building were collected by rooms and grades, and each bundle was properly labeled. These samples were then given key-numbers, and put up in bundles of 150 to 200 papers each, and assigned to about one hundred teachers who were especially good in handwriting, who volunteered to score the papers by the Thorndike scale. When these papers were returned and the scoring studied, it was found that the standards of the scorers, even when the scale was used, were so different that the comparisons of rooms or buildings would be worthless. Then it was determined to take a group of normal-training-school students and train them to use the Thorndike scale. Twenty of these students were chosen. The material used was that devised by Dr. E. L. Thorndike and described in the *Teachers College Record* for November, 1914. The standard specimens were graded independently by the normal students on eight different days. After each grading a conference was held and specimens that were not accurately graded were studied more closely. Freeman's suggestions on grading handwriting were also read by the students. Although no effort was made to follow the Freeman plan, yet it perhaps had some influence in their grading. The standard specimens were cut apart, their numbers concealed, and then the specimens graded. Also at these daily conferences twenty samples of the students' writing were numbered serially and were graded by each of these normal students, and the twenty students then compared their results on each of these specimens. In this way, in about two weeks they became so skilful that they varied only 3 to 5 per cent on a group of twenty papers. This body of twenty students then for a small stipend graded 57,863 writing samples. The ranges and medians for the city are given in Tables IX-XI.

Mr. Freeman's standards (Table XII) are for an eight-grade system. For the Kansas City schools with a seven-grade system the standards

TABLE IX  
RANGES IN CLASS MEDIANS IN QUALITY-HANDWRITING

Grade	October	May	M-O	H
VII.....	8.1-11.5	8.4-14.0	8.5-14.0	8.8-13.8
VI.....	7.9-11.2	8.2-11.9	8.2-14.1	8.5-13.2
V.....	7.5-10.3	7.5-11.0	7.1-11.6	8.3-12.0
IV.....	7.5- 9.7	7.1-10.9	7.1-10.1	6.3-12.2
III.....	6.8- 9.6	6.8- 9.9	7.0-10.0	6.8-11.1
II.....		5.9- 9.0		6.2-10.1
I.....				5.5- 9.3

October = October papers.

May = May papers.

M-O = May papers of the same pupils that were in these grades in October.

H = Special papers collected by the writing supervisor.

TABLE X  
RANGES IN CLASS MEDIANS IN SPEED-HANDWRITING

Grade	October	May	M-O
VII.....	17.5-119.0	50.5-118.0	50.5-118.0
VI.....	34.0- 93.0	35.5-111.0	35.5-105.5
V.....	21.5-107.0	49.5-100.5	50.5- 99.0
IV.....	11.5- 83.0	39.0- 91.5	44.5- 81.0
III.....	14.5- 63.5	29.5- 69.0	30.5- 83.0
II.....		15.5- 78.0	

TABLE XI  
CLASS MEDIANS IN HANDWRITING

GRADE	QUALITY				SPEED		
	October	M-O	Gain	H	October	M-O	Gain
VII.....	9.5	10.6	1.1	11.4	72	77	5
VI.....	9.1	9.9	0.8	11.0	65	76	11
V.....	8.7	9.4	0.7	10.5	60	69	9
IV.....	8.2	8.8	0.6	9.3	49	64	15
III.....	8.0	8.2	0.2	8.4	35	53	18
II.....				7.6			
I.....				7.2			

of Table XIII are proposed. It is to be noted that the quality suggested for the seventh grade is only 12. These standards are for the quality of work at the end of the year. A pupil who on completing the sixth grade writes quality 11.5 on the Thorndike scale at the rate of 80 letters per minute has reached the sixth-grade standard in writing.

TABLE XII

FREEMAN'S PROPOSED STANDARD FOR QUALITY AND SPEED IN HANDWRITING  
(The quality is converted into units of the Thorndike scale instead of the Ayres' units)

	SCHOOL GRADE						
	II	III	IV	V	VI	VII	VIII
Quality.....	8.0	8.4	9.1	10.0	10.7	11.6	12.7
Speed.....	36	48	56	65	72	80	90

TABLE XIII

PROPOSED STANDARDS FOR KANSAS CITY SCHOOLS—SPEED AND QUALITY

	SCHOOL GRADE					
	II	III	IV	V	VI	VII
Quality.....	7.5	8.5	9.5	10.5	11.5	12.0
Speed.....	36	48	60	70	80	90

That these standards are easily attainable is indicated by the fact that in May the six rooms doing the best work in each of the various grades of the city averaged 0.6 of a Thorndike point above the standard in quality proposed, and also averaged 21 letters per minute above the standard in speed. Even in October, the six rooms doing the best work averaged only 0.5 of a Thorndike point below the proposed quality, and the average speed in October of these rooms was 10 letters per minute above the standard. It is not expected that every pupil in a room will reach the standard set, but the majority should reach the standard, and the higher the quality of teaching, the fewer will be the exceptions. The standard quality and speed should be maintained in all written work.

Good teaching and good grading keep pupils of like ability together. When a pupil reaches the standard in writing for his grade, he may give



his attention to other studies. The presence in a room of a few especially good writers is no guaranty of good teaching. They are usually natural exceptions. In some cases, indeed, they are actually the products of poor teaching—the kind of teaching that takes care of the promising pupils to the neglect of the remainder.

In October, 1,743 of the writing papers were worth 12 or more; this was about 11 per cent of the whole number of papers graded. At the same time 2,076 pupils wrote more than 90 letters per minute. It is a waste of time to require pupils who can write quality 12 at the rate of 90 letters per minute to continue practice in writing. The sixty hours of school time usually devoted to writing each year should be devoted to other work by pupils who have reached the standard. All attempts to train beyond a reasonable standard result in much waste of time and energy. Of the special papers prepared for Mr. Holt in May, 3,650, or about 18 per cent, were graded 12 or above. These people are doing satisfactory writing, and 2,400 of these pupils are below the seventh grade. It is possible that the high quality of these papers was obtained at the sacrifice of speed.

These facts show conclusively that there are large numbers of the elementary-school pupils who write well and rapidly. A school system should be judged, not by its best nor by its poorest product, but by its average product. The average writing product in the Kansas City schools, while comparing very favorably with the average product in other systems, is not quite so good in quality or in speed as it should be. With definite standards to be reached and close supervision by the writing supervisor, in a year or two at most the standards proposed should be reached by practically all rooms. In fact, a few entire school buildings have now reached the standard. Some buildings last year gained nearly 2 Thorndike points between October and May. However, the standard calls for only 1 point advance each year. Hence, schools below standard should be able, by extra effort, to advance to standard.

Mr. Freeman, in discussing his proposed standards in handwriting, says:

The data which have been presented indicate that this standard can be attained with an expenditure of time of not over 75 minutes a week. The writer is convinced on the basis also of some of the data that it could be attained generally, as it is in some cases, by the expenditure of a much shorter amount of time. When the most efficient methods are employed, it will

probably be found that the expenditure of from ten to fifteen minutes in the intermediate grades suffices to fix the handwriting habit in its main outline, and that the expenditure of a small amount of time in the upper grades will maintain the efficiency of the habit and increase it by the amount of progress which is represented in the standard.

From the investigations made thus far I am of the opinion that generally, not only in Kansas City, but in other cities, too much emphasis is placed on writing in the lower grades. With well-directed work in Grades III, IV, V, writing can be fairly well mastered. Increased speed and improved quality in the sixth and seventh grades will come with very little practice—one or two ten-minute periods per week—if right habits have been established in the intermediate grades.

Rooms below standard are advised to make an "extra effort" on penmanship. This does not mean additional time, but better methods of teaching, more specific and purposeful drills, a closer study of the needs of the class, the elimination of waste, and more corrective individual work. Without doubt ample time is spent in the teaching of penmanship in all the grades and too much time in some grades.

## CHAPTER XII

### THE EFFECTS OF EFFICIENCY TESTS IN READING ON A CITY SCHOOL SYSTEM

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At the request of the committee the following brief statement is made of the effects of a series of tests in reading on the teachers and administrators of a school system. It is not the purpose of this paper to repeat the tables showing the numerical results of these tests, but rather to comment briefly on the significance of the tests for the system of schools.

In the beginning the teachers were somewhat skeptical as to the purpose of the tests. Some thought that it was an attempt to check up the work of the individual teacher as a basis for determining his or her efficiency. There was no large amount of experience in the system itself in the giving of tests or in the evaluating of results. The selection of the subject to be investigated was determined in part by the interests of the supervisors and in part by the suggestions derived from earlier scientific studies on reading.

After a number of conferences between the superintendent and the supervisors of the system, the following program was adopted as a suitable one for a series of tests: (1) to ascertain the rate of reading, both oral and silent, as it is now taught in this system of schools; (2) to ascertain the relation that the rate of reading of one grade bears to its next higher grade as a standard of advancement; (3) to ascertain what factors are of greatest influence in affecting the rate of reading; (4) to ascertain the relation that the rate of reading bears to the result achieved in the process of reading considered as a thought-getting process.

The immediate result of the tests was to call the attention of the teachers to many problems of method which had heretofore entirely escaped their attention. Their original notion was that the way to teach reading is to read, read, read. The moment they began to perform these tests, it became evident to them that the child, in learning to

read, is facing a multitude of difficulties without being guided by any definite notion of how to proceed. In fact, they learned that it is important for the teachers, as well as for the students, to make distinctions that heretofore had escaped their attention. This is well brought out in the following quotations from individual grade teachers:

1. "We do not know how to teach silent reading."
2. "We had not realized the importance of efficiency in silent reading as related to the rest of the subjects."
3. "We are going to emphasize silent reading and the grasp of content."
4. "We will not teach oral reading less, but silent reading more."
5. "The problem is ours. We will assist in its solution."
6. "We have a new interest in teaching reading."

A brief summary may be given of the general and specific results which came from the series of tests.

#### GENERAL

1. The attitude of pupil and teacher toward the subject changed.
2. The utility of silent reading stressed.
3. Greater emphasis placed on the proper method of presenting and conducting reading-lessons, especially so far as the rate of reading and the grasp of content are concerned.
4. Closer correlation of reading with the other subjects.

#### SPECIFIC

1. A more definite standard for judging the efficiency of reading.
2. A more elastic system of promotion by subjects.
3. Closer attention to the individual differences of pupils in reading ability, thus adapting more closely the type of training to the individual pupil.
4. A greater economy of time effected in teaching the subject.
5. Greater intelligence and interest in the use of standards and tests in judging results of teaching.

Perhaps many of these results may seem to the reader overstated. However, great care has been taken in the formation of these judgments to ascertain and formulate premises based upon the direct experience of teachers who are daily presenting the work in the classroom. The results seem to indicate that the study has been very beneficial in

achieving higher quality of teaching, not only in reading but in other subjects as well.

At the time of writing this article teachers of the English department in the high school (unsolicited) brought the report that pupils in the language department showed much greater preparation than in former years. This improvement in language is believed to be in part due to the emphasis on the reading work of the elementary schools.

This, with other evidences, seems to justify the belief that the school system itself has been greatly improved through the interest aroused in this study. Let me mention especially four ways in which the entire system is affected:

1. A more scientific attitude and method in the subject is established.
2. A closer checking-up of results is obtained.
3. More definite teaching is practiced.
4. More efficient learning results.



## CHAPTER XIII

### INVESTIGATION OF SPELLING IN THE SCHOOLS OF OAKLAND, CALIFORNIA

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An extensive investigation of the subject of spelling was made in the Oakland schools during the past year, covering Grades II–VIII inclusive, in forty of the forty-one schools of the city. In addition to an examination of the general administrative policy affecting spelling, the schedules of time-allotment, the content of the course, lesson-assignments, and methods and devices in use in the classrooms, a test of the efficiency of spelling was made by the use of the Ayres Springfield lists.<sup>1</sup> The tests were applied to 12,985 children.<sup>2</sup>

The tests were all given on the same day, to the younger children in the forenoon, and to the older children in the afternoon. The words were pronounced in the usual way by the classroom teacher, in the presence of a member of the investigating staff (some fifty advanced students of education had been carefully instructed for this purpose). The words were marked, partly by students, and partly by principals and teachers. No principal or teacher marked papers from his or her own school.

The purpose of the study was to get together the facts necessary as a basis for a scientific handling of this branch of the curriculum, to interpret these facts in the light of sound principles of administration, supervision, and teaching, and to make the results available for study by those engaged in supervising or teaching the subject.

The results of the tests were expressed in terms: first, of group averages; secondly, of the distribution of individual scores within these groups; thirdly, of individual differences due to (a) age, (b) sex, and (c) general ability (teacher's estimate); fourthly, of social differences

<sup>1</sup> These lists have since been embodied in a complete spelling scale. See Leonard P. Ayres, *Measurement of Ability in Spelling*. New York: Russell Sage Foundation, 1915.

<sup>2</sup> The full report is published by the Oakland School Department as *Publication No. 1* of the Bureau of Information, Statistics, and Educational Research, June, 1915.

due to (a) father's occupation, (b) father's nationality, (c) the child's occupational ambition, and (d) the child's home language; fifthly, of the relation between time-allotment and spelling ability.

In terms of the standard (70 per cent) the averages for the city as a whole, for all but three of the separate schools, for all grades but second and third, rank high. The average score for the city is 76.5 per cent. The difference between averages attained by different schools is wide; the higher scores are attained by the larger schools. In some schools grade averages vary but slightly, while in other schools such variation is extremely wide. Also, when the scores of all the children in the city are averaged by grades, these averages vary as much as 24 per cent, and the variation of class averages within a given grade is even wider still, while the distribution of individual scores within a class, a grade, or a school, ranges from zero to perfect. And since 21 per cent of all the children in the city made perfect scores, it is evident that the test was inadequate.

The overlapping between grades and the wide difference between scores attained by different schools and by different grades show that there is no common standard for promotion in this subject.

Incident to the study of scores in the light of individual differences the schools were found to be over 60 per cent retarded. Every grade contained children at least eight years apart in ages, and a careful study showed that the accelerates invariably scored higher than their grade averages, while retardates regularly fell below, and the more retarded the lower their scores.

The influence of sex, while not pronounced, is fairly constant, with a tendency to increase with age. And the correlation between general ability (teacher's estimate) and ability to spell is constant and marked.

Differences between the scores of different social groups, as indicated above, appear, but they are not pronounced, and the effect of the home language, either as to extent or type of errors, is practically negligible.

There is no evidence in the results of the tests, nor in other information gathered, to show that spelling is standardized in respect to content, method, length of lesson-assignment, time-allotment, or amount to be learned. From the standpoint of group averages the schools stand high, but from the distribution of individual scores it is evident that important individual and social differences do not enter as determining factors in the organization and teaching of the subject.

## CHAPTER XIV

### STANDARD TESTS AS AIDS IN THE CLASSIFICATION AND PROMOTION OF PUPILS

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The two chief sources of waste in education are (1) teaching things that the bright pupils already know and (2) teaching things that none of the pupils need to know. Economy in the latter will be achieved by ascertaining what the really essential and important things in each subject are. Economy in the former will be achieved by classifying and promoting pupils, not according to time, but according to ability.

One third of the pupils waste time by being in classes in which they know practically all the material that is being covered in the recitation period and are able to perform all the tasks expected of them. Another third of the pupils waste time by being in classes in which they can grasp very little of the material and are able to perform very poorly, or not at all, the tasks expected of them.

One pupil out of every three is promoted too slowly and one pupil out of every three is promoted too rapidly. One pupil in every three could finish the eight grades in seven years or less, and one pupil in every ten could finish the eight grades in six years or less. The reason for this situation is that the schools do not know in any accurate way the actual abilities of their pupils and are unable to compare in any precise manner the abilities of the pupils with one another. The result is that there are no definite, tangible standards with which the pupil of any given grade can be compared so as to ascertain whether he is up to the standard or not.

I shall now attempt to show by concrete examples the basis of these assertions and the means by which a more accurate classification of the pupils may be brought about.

Standard tests in reading, writing, spelling, and arithmetic were carried out in an elementary school in Madison composed of approximately 350 pupils. The results of these tests are shown for each subject and for each grade by the distribution-curves in the following figures.

Let us examine first the performance of the pupils in writing. The tests were designed to measure speed and quality of writing and were performed according to the specifications published by the writer in the *Journal of Educational Psychology*, February, 1915. The speed of writing was expressed in terms of the number of letters written per

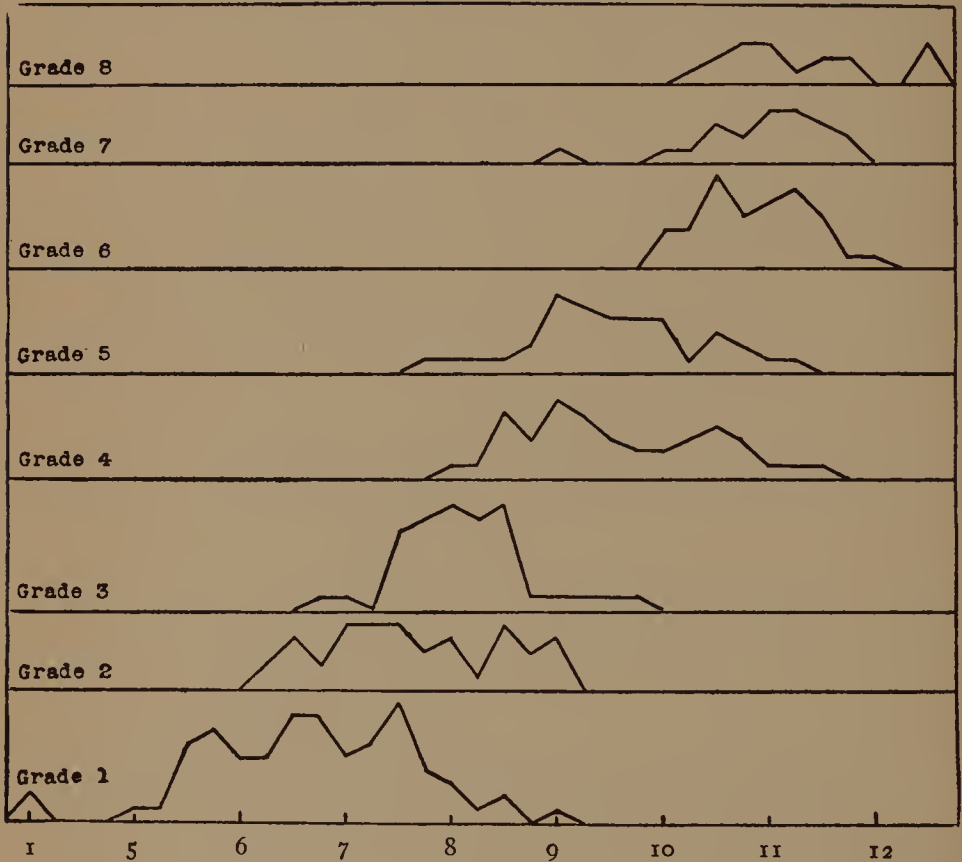


CHART I.—Distribution of pupils in writing in Grades I-VIII. The numbers along the base-line are the scores expressed in terms of the Thorndike scale.

minute, and the quality was measured by the Thorndike scale. By a process of equating speed and quality so as to express a pupil's writing ability in a single score, all the results were evaluated and represented in the curves of Chart I. The numbers along the base-line from left to right are qualities on the Thorndike scale. The distances vertically above each base-line represent the number of pupils. Thus it will be seen that the pupils in the first grade range all the way from quality 4 to

quality 9, and the pupils in the second grade range all the way from quality 6.25 to quality 9. The striking fact is the enormously wide range of abilities in each grade and the resulting overlapping of the abilities of one grade over those of the other grades. By actual computation, 32 per cent of the pupils in any given grade equal or exceed the median of the next grade above it. A corresponding percentage of pupils equals or falls below the median of the next grade below.

The tests in reading were designed to measure speed and comprehension and were made according to the specifications published by the writer in the *Journal of Educational Psychology*, January, 1915. The reading ability of each pupil is represented by a single score in which his performances in speed and in comprehension are combined. The results are shown in Chart II in a manner similar to that met in Chart I. The facts for reading are similar to those for writing. The range of ability in each grade is enormously wide, and the overlapping is likewise extensive. In the case of reading, 31 per cent of the pupils in any given grade reach or exceed the median of the next grade above.

The tests in spelling were made with the lists published in the *Journal of Educational Psychology*, March, 1915. The distributions and overlappings, as shown in Chart III, are in all essential respects identical with the two preceding tests. Twenty-three per cent of the pupils of any given grade reach or exceed the median of the next grade above.

Ability in arithmetic was measured by means of the Courtis tests, Series A. It was found that 32.5 per cent of the pupils in any given grade reach or exceed the median of the next grade above.

The question which now arises is this: Would not the range of ability and the overlapping be very much less if each pupil's performance in all studies were combined? Thus, a fourth-grade pupil might write as well as the average seventh-grade pupil and read as well as the average fifth-grade pupil, but spell no better than the average first-grade pupil. His average performance in all studies combined might be approximately what it should be for the fourth grade.

What are the actual facts? A combined score for all studies was computed for each pupil, so that the various subjects were balanced against each other. It was found that even then the overlapping was practically as large. Thirty-two and two-tenths per cent of the pupils in any given grade reach or exceed the standard of the next grade above



it; thirty-five and two-tenths per cent fall to or below the standard of the next grade below. The schools have not been able to measure in any accurate manner the actual abilities of the pupils, nor to compare them with any objective standards.

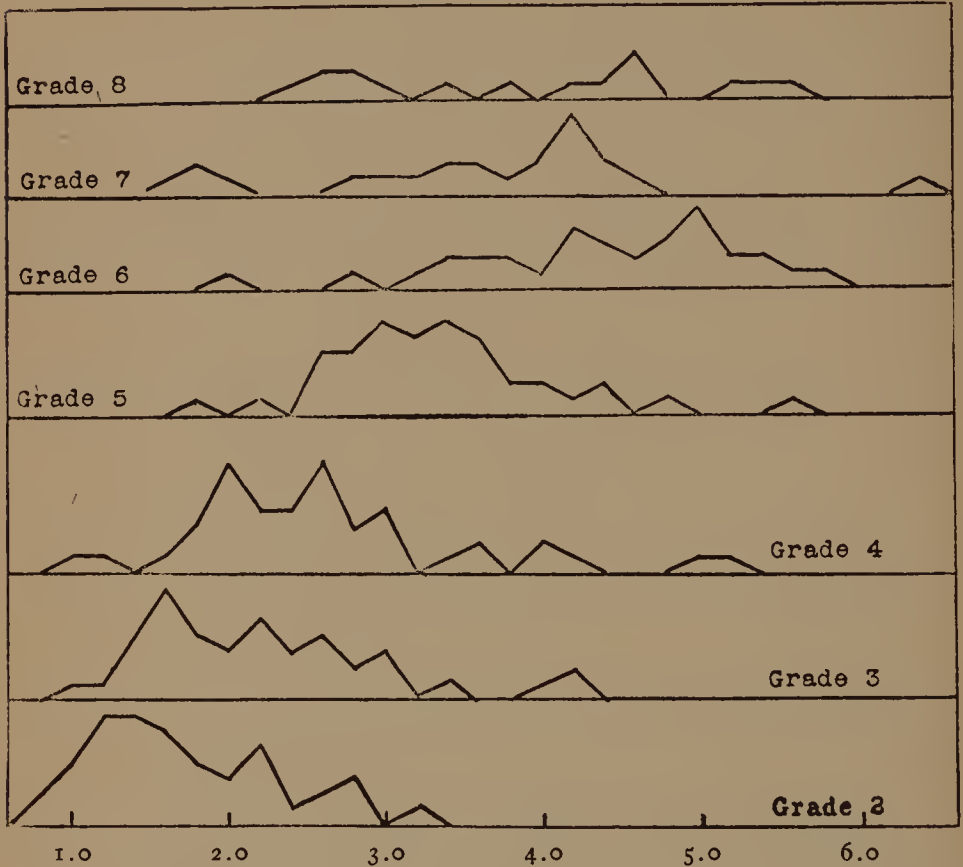


CHART II.—Distribution of pupils in reading in Grades II-VIII. (The numbers along the base-line are the scores in which speed and comprehension are combined, but expressed in terms of words read per second.)

It is obvious that a considerable economy in time could be effected by classifying and promoting pupils according to their actual abilities or performances in the various studies. One-third of the pupils are one or more years ahead of the grade in which they are placed and could, therefore, complete the elementary school one year earlier and be fully up to the standard of the average eighth-grade pupil.

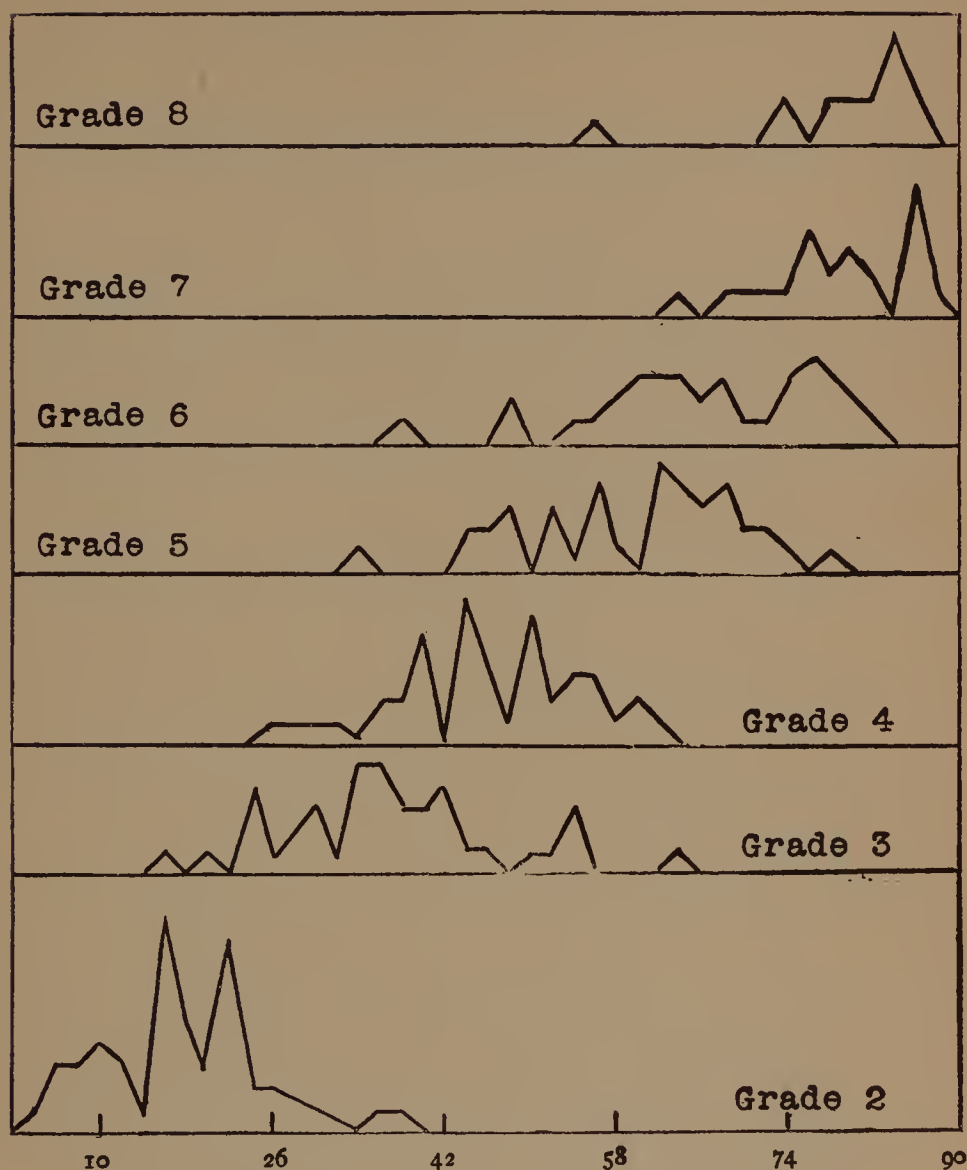


CHART III.—Distribution of pupils in spelling in Grades II-VIII. (The numbers along the base-line represent the percentage of words spelled correctly in the specified lists.)

Every school system ought to have a department of testing by means of standard scales and tests, so that the actual abilities and achievements of pupils could be rated accurately and made use of in classification and promotion. The principle of promotion according to ability rather than according to time would also have the advantage of acting as an incentive to the pupils to do their best.

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## CHAPTER XV

### THE USE OF MENTAL TESTS IN THE SCHOOL

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The object of mental tests, practically considered, is to secure by a relatively refined and precise method a more accurate determination of the mental traits or the general mental status of a pupil than can be secured by other methods, as by inspection of his marks or his school progress or by the teacher's personal estimate. Roughly speaking, the mental tests now available for use with school children are of two sorts: first, those which aim to determine with some precision the presence or the absence or the amount of some specific mental characteristic, e.g., tests of memory-span, of quickness of learning, of pitch discrimination, of color-blindness, etc.; secondly, those which aim to determine with perhaps somewhat less precision the general status of the child's intelligence, his mental level or general all-round ability as related to that of other children of the same nationality, sex, age, and social status. In this second field the Binet-Simon tests have received such preponderant emphasis and attention as to constitute at present almost the only system of tests of general intelligence with which the educational public is acquainted.

In principle, the first sort of tests—those which bring to light specific mental abilities—are of most decided interest and importance for the work of the schools. In practice, they have received almost no attention from school men, and it is impossible because of that, and more especially because they necessitate the participation of an investigator who possesses special training in general, experimental, and applied psychology and a good acquaintance with schoolroom problems, to urge at this time any wholesale adoption of them in public-school systems. What we should urge is that, in those school systems in which the conditions are favorable for the development of educational research, there should be created the office of *consulting psychologist* and that this official should be commissioned to make intensive studies of all sorts of special

cases in which the analysis of mental abilities and disabilities would throw light upon the means of instruction that would accomplish maximal results for school progress. There is no school system of any size that does not contain dozens and scores of pupils who present special psychological problems. Examples are: pupils that cannot learn to spell, pupils that have special difficulty in committing to memory, pupils that are slow in acquiring the technique of reading, pupils that display exceptional gifts in special lines of work, pupils that seem to be tone-deaf, pupils that present peculiar and seemingly inexplicable resistance to disciplinary control, pupils that exhibit speech disorders developed from compulsory right-handedness. In fine, the painstaking scrutiny and intensive study of all individuals that exhibit striking peculiarities in their mental equipment is a form of educational research that is greatly to be desired, that some of our best-equipped school systems could readily afford, and that demands for its prosecution the application by an expert of numerous special forms of mental tests.

Tests of the second sort—test-systems designed to measure general intellectual status—have come into considerable prominence in the past decade through the interest developed by the Binet-Simon tests. These tests were first proposed in 1905 by the eminent French psychologist, Alfred Binet, and his collaborator, the physician, Dr. Simon, in response to an inquiry as to what devices might be used to segregate, for placing in special classes, pupils too defective mentally to profit by instruction in regular classes. This preliminary statement was replaced in 1908 by a more systematic formulation and this 1908 series was again replaced three years later by what is known as the 1911 revision. The extraordinary cleverness with which they were devised, the novelty of the principles they embodied, and their surprisingly satisfactory outcome from the schoolman's point of view, all conspired to focus upon these tests the active attention of psychologists and educators in all civilized countries. The extent of this activity may be gauged by the number of titles, 254, in the Binet-Simon bibliography published by Kohs in 1914. One consequence of this activity has been a flood of criticism, both constructive and destructive, which renders anything like an authoritative standardization of every detail of procedure in the application of these tests quite out of the question at the present time. Fortunately, however, from the immediately practical point of view, it is unnecessary to go into these technical details of criticism.



This report, then, will be limited to demonstrating by reference to several typical studies in American cities that the Binet-Simon tests are valuable devices for the administration and organization of school systems, to pointing out certain limitations in the tests, and to suggesting certain precautions that should be observed in their use.

As typical studies of the usefulness of the tests in this country we shall cite those by Goddard<sup>1</sup> (1911), Dougherty (1913), Adler (1914), Brigham (1914), and Hicks (1915).

Goddard reports upon the testing of all the pupils (2,000) of the public schools of Vineland, New Jersey, wherein it was found that 78 per cent of the pupils were "normal," in the sense of being either "at age," one year "advanced," or one year "retarded" when their mental is compared with their chronological age. Pupils testing two or three years behind their age, 15 per cent of the school population of the first six grades, are regarded as "merely backward," and as needing to be placed in special classes in order to profit adequately by instruction. Pupils testing four or more years behind their age (3 per cent of these were found) are ranked as feeble-minded. Particular attention is called to the equally serious misfits on the other side of the curve of distribution, i.e., to those gifted children who are not placed in the school grade which their mental attainments indicate. "Nothing could be clearer," says Goddard, "than the way in which these figures [referring to one of his tables] demonstrate what we all know from experience must be true, that is, that we drag the dull child up, trying to keep him up to his grade and hold the bright child back to keep him to the same grade, thus doing gross injustice to both." The following excerpts from his results are sufficiently typical to show what amount of disparity exists between the actual grading of children and the grading indicated by the Binet tests.

	Number	Percentage
In grades above what Binet scale would warrant . . . . .	121	9.4
In grades corresponding to what Binet scale would warrant . .	558	43.2
In grades below what Binet scale would warrant . . . . .	558	43.2

The question at once arises: How far should the school be expected to show conformity to the Binet results in its grading? To this we may return later. Suffice to say that after all allowance is made, there

<sup>1</sup> Consult the references at the end of this chapter for sources.

remain many cases in which pupils are wrongly placed, and that the Binet scale offers one method of bringing the discrepancies to light.

In 1913 Miss Dougherty reported upon the results of Binet tests applied to 483 pupils of the public schools of Kansas City, Kansas, whose ages ranged from six to seventeen years and whose school grades ranged from the first to the eighth. While expressing the hope that the scale may be improved in certain details, this investigator quotes as directly applicable to her own results the following statement of Goddard (in the report above cited):

It is almost beyond the bounds of possibility that we should get such figures as are shown in this table [a general distribution of results] unless the figures upon which it is based are amazingly accurate, and if they are accurate it gives us a wonderfully valuable method of measuring our efficiency and our accuracy in the grading of children, and points out the possibility of great improvement along this line—much to the advantage of the children and the comfort of the teacher.

Miss Martha Adler, assistant principal of Public School 77, New York City, reported in 1914 the results of two experiments upon the classification of pupils on the basis of Binet testing. In her first experiment 80 first-grade boys were tested in the middle of the year and the 35 who stood highest were placed together as the advanced section, while the remainder formed the regular section. Both sections were then carried forward as fast as their abilities would permit. The result was distinctly better progress for *both* sections than under ordinary methods of sectioning, that is, on other bases than mental ability. Her second experiment dealt with 89 fourth-grade boys; the general plan was similar and the results were similarly striking. Miss Adler is convinced that the Binet tests are worth while, not only for the pupils, but likewise for teachers and supervisors. Her experiments are of interest because they demonstrate the utility of mental tests for the classification of "normal" pupils into sections *within* the regular classes. On the need of such classification she says:

Although a large majority of pupils enter school at six, a difference in their mentalities is manifest almost at the outset, and after a few weeks two or three groups are formed to provide for the different grades of intelligence. In other words, there are three classes in one class. Allowing for the most efficient instruction, and for a skilful use of that educational time-killer "busy work," we are nevertheless forced to admit that there is an incredible amount of time

wasted, and almost superhuman energy expended in attempting really to supervise two groups while teaching a third. In the higher grades the grouping is usually done sparingly, because of the sheer impossibility of covering the mass of subject-matter laid down in any way except by class instruction. Subject-matter increases in importance as the child advances—in fact, we are too much bound by a curriculum, and classifications, gradations, and groupings are made with reference to it, rather than with reference to the pupils. What we need is something which will increase the importance of the child's individuality.

In the same year, 1914, C. C. Brigham published results secured by applying the Goddard 1911 revision of the Binet-Simon scale to 309 pupils in the first six grades of the Princeton Model School. Brigham concludes that the scale not only graded accurately "in the long run" pupils of from seven to eleven years of age (there were too few cases at six years to generalize from), but was also "an adequate measure of individual differences at any of these ages." "This conclusion," he adds, "may be qualified by defining 'accurately measured' as a correct measure 96 per cent of the time, but there is strong probability that this measure approached complete accuracy."

During the past year, 1915, Vinnie C. Hicks, consulting psychologist of the Oakland, California, schools, has reported tests of all the children in a kindergarten of that city to discover whether the results showed a good correlation with the actual school progress of the children. Her final conclusion is that "the Binet tests given to entrants to the first grade would not result in any unjust labeling of them as mental defectives." On the contrary, "the most evident fault of the tests, if used as prognosticative of school progress, is over-optimism." Again she says: "The chief value of giving the tests would be in having them productive of proper distribution of entrants according to ability, into regular classes, classes for the slow but intelligent, special classes for the subnormal, expulsion [from the classes of the regular school system] for the feeble-minded."

The foregoing citations from five studies in American public-school systems represent, it will be understood, only a fraction of the available material.<sup>1</sup> They are adduced here as being enough to demonstrate that

<sup>1</sup> From Wallin, (*Mental Health of the School Child*, chap. xviii) it appears that the Binet tests are in use in at least the following American cities: Albany, Allentown, Altoona, Auburn, Aurora, Baltimore, Birmingham, Bloomfield, N.J., Buffalo, Cambridge, Camden, Chester, Cincinnati, Cleveland, Columbus, Dayton, Detroit, Denver,

the Binet-Simon tests can be used to distinct advantage in the classification and grading of school children from the very first day of their work in the schools. It goes without saying that the use of the tests in this manner presupposes the actual organization within the school system of sections or groups of pupils classified in accordance with the tests. This is not the place to discuss the details of such organization, save to point out that every bit of the evidence indorses a plan of organization which embodies more than two such sections of groups within each of the usual school grades. Eventually, we shall undoubtedly seek to develop in all school systems at least four groups: the gifted group, the regular group, the slow group, and the group of moderately defective mentality. A fifth group—the mental defectives whose insufficiency is marked—will be relegated to special custodial institutions. This plan of organization will be recognized as essentially the one widely and favorably known as the Sickinger, or Mannheim, system, now in operation in Germany.

Stress has been laid in the preceding paragraphs upon the adequacy of the Binet-Simon tests in the differentiation of “normal” children into groups of approximately similar mental abilities. If the tests are adequate for this differentiation, it follows, *a fortiori*, that they are unquestionably adequate for the detection and segregation of the distinctly mentally defective group, including both the more serious cases that need institutional treatment and the less serious cases that need instruction in special classes in the public-school system. On this account no specific citations will be made here to the very extensive literature upon the use of the tests for organizing special classes for mental defectives, though this is the field in which the tests have been most often used and for which they were originally designed.

It remains, now, to consider certain limitations of the Binet tests and to note certain precautions that should be observed in their use.

Elizabeth, Englewood, Everett, Wash., Goldsboro, N.C., Grand Rapids, Hackensack, Harrisburg, Hibbing, Minn., Hoquiam, Wash., Houston, Jersey City, Lakewood, Ohio, Little Rock, Long Branch, Los Angeles, Louisville, Malden, Mason City, Iowa, Minneapolis, Montclair, Mount Vernon, Morristown, Muskegon, Mich., Newark, New Britain, New Brunswick, New Haven, New Orleans, North Bergen, N.Y., Newton, Oakland, Cal., Passaic, Perth Amboy, Philadelphia, Pittsburgh, Plainfield, Princeton, Raleigh, Reading, Richmond, Rochester, N.Y., Saginaw, St. Louis, Schenectady, Somerville, Mass., Somerville, N.J., Spokane, Springfield, Mass., Toledo, Trenton, Washington, West Hoboken.



Every expert who has dealt with the tests has found points to be criticized in them. No one claims that they are ideal or even as perfect as might be from a practical standpoint. Nearly everyone agrees that the tests of the lower school ages—up to the eighth year—are too easy, and that those of the higher ages—especially above the eighth year—are somewhat too difficult. The composition of the several tests has been criticized freely: some of them are felt to depend too much on school training; some of them are quite certainly wrongly placed (even in Binet's 1911 revision); others are condemned on the ground that they offer a one-to-one chance of success by mere guessing; still others are admittedly difficult to score. Similarly, the composition of the series for the several years is open to discussion; need is felt for an extension of the series above twelve years, and possibly for the insertion of finer gradations in the lower years; the interpretation of the data, particularly when certain tests are missed in the earlier years and others passed in the later years, offers much chance for debate. These and other criticisms can be offered against the Binet scale. Nevertheless, they are sufficiently met for our present purposes by the one outstanding fact that the tests, even with these imperfections, *do* work. School men need not cast aside an educational device just because it is open to improvement.

More important, in our opinion, than these details of improving the technique of the scale is the possible misinterpretation of what the tests really do for us. It should be understood, for example, that they do not pretend to afford a precise and comprehensive view of the mental aptitudes of the pupil. They tell us merely that, taken as a whole, a given pupil can do approximately those things that most children of a certain age can do. But in another way, two pupils might both test eight years mentally and yet be very different from one another; an imbecile who tests eight years and who is actually twelve years old has quite a different mind after all from the normal eight-year-old child.

Again, it is important not to forget that even if the tests should measure native ability ideally, still we should not expect a complete correspondence between the test results and school progress, for the fairly obvious reason that school progress depends on other factors than native ability. Industry and zeal, good home-conditions, docility, inclination for "bookish" pursuits, freedom from illness, conformity to the school routine, these and other factors play their rôle. The point is, however, that these conditions are relatively accessible to modification



and control, whereas native ability, in the nature of the case, is a primary and uncontrollable prerequisite for school success. It follows that the determination of the general intellectual status cannot be neglected, even though some pupils of moderate ability are able to get higher marks than other pupils of superior ability.

In the actual administration of the Binet tests there arise several important questions. One of these, in particular, has aroused considerable debate. Must these tests be administered by a specially trained expert or may they be administered by any classroom teacher? On this point there is disagreement. Our opinion is between the extreme views. We should recommend the employment wherever possible of an expert psychologist who has had experience, not alone in the psychological laboratory, but also in the conduct of mental tests generally, and who is also familiar by personal contact with the various forms of mental deficiency to be found in institutions for the feeble-minded, who could qualify, in short, as an expert psycho-clinician.<sup>1</sup> But, where circumstances prevent the employment of an expert psycho-clinician, we are of the opinion that selected teachers may be trained to perform the most necessary selection of mentally defective pupils with sufficient accuracy to warrant the adoption of this plan. We would recommend that these teachers should be able to present most, if not all, of the following qualifications: (1) at least a general familiarity with the classroom work of the grade schools, (2) a degree of general intelligence better than the average of elementary-school teachers, (3) familiarity with general elementary psychology, educational psychology, and, preferably also, experimental psychology, (4) familiarity with the main aspects of personal hygiene and of school hygiene (with special emphasis upon physical defects and their relation to mentality), (5) knowledge of the history, aims, methods, and results of the special classes for mentally defective children as operated in public schools, (6) special drill in the administration of mental tests, including the technique of the Binet scale, and knowledge of the principal proposals for its modification and extension, (7) personal observation of numbers of feeble-minded children

<sup>1</sup> The proper qualifications for psycho-clinical work have been set forth at length by J. E. W. Wallin, whose views may be taken as an example of those who would restrict diagnostic work with mental tests to persons of quite varied and exceptional training and experience.

as gathered in institutions for mental defectives.<sup>1</sup> Opportunities to secure this special training are now offered by a number of universities, particularly in their summer-school courses. It is also gratifying to note that several of the institutions for the care of the feeble-minded are opening their classes for observation and practice work to limited numbers of properly qualified teachers and supervisors of special classes for mental defectives. We would recommend that school boards directly or indirectly subsidize selected teachers to enable them to secure adequate training in this field.

Another question often debated is: Which of the numerous formulations of the Binet tests should be used? In our opinion, for the purposes of such classification as is here recommended, little or no difference will appear in the results from the use of different formulations. When the basal year is ten or over, we incline to favor the arrangement of the tests proposed by Kuhlmann or by Terman (known as the Stanford revision) rather than the earlier and more frequently used "standard method" published by Goddard, simply because a number of the modifications tentatively introduced by the last-named have been found to be undesirable. Yet the Goddard formulation has the merit of greater ease in handling and administering. It is, moreover, in more common use than the others. Its results are equally good for ages under ten. The *Teachers' Manual* prepared by Professor R. A. Schwegler (14), and published by the School of Education of the University of Kansas, has also an excellent account of this scale and a verbatim set of directions for its conduct.

Whatever arrangement of the scale is used, there are certain general directions for testing that are important if standardized results are to be obtained. The following may be deemed especially essential:

<sup>1</sup> These recommendations accord with the resolution adopted by the American Psychological Association, at its Chicago meeting, December, 1915, deprecating the use of mental tests for purposes of practical diagnosis by persons psychologically unqualified for such work. Since the purport of this resolution has been wrongly stated in certain newspapers, where it has been declared that the American Psychological Association "put its ban on the Binet tests," it would seem not inappropriate here to warn school officials against supposing that the Binet scale has been officially discredited by professional psychologists and against supposing that any person, regardless of training, is competent to apply the scale and either to commend or condemn it.

1. *Isolation*.—Conduct the test individually in a quiet, well-lighted room, free from interruption, and without the presence of parents, teachers, or other children. An assistant, who shall record all responses verbatim, may be used to advantage when time is to be economized.

2. *Preliminary observation*.—Don't start the testing at once, but take a few minutes to get acquainted with the child and to disarm suspicion or timidity. We have found it useful to measure weight, height, vital capacity, strength of grip, vision, and even hearing (quite roughly), and with younger children to try the form-board. These physical tests are directly interesting to the child and they often reveal to the examiner physical defects that account for what seems to be mental insufficiency. Naturally, this preliminary observation must not be long enough to wear out the child before the Binet tests are begun.

3. *Encourage*.—Avoid anything that suggests an inquisition. Never show impatience. Never ridicule. Be tactful and sympathetic. Never correct the child. Never state flatly that his answers are wrong.

4. *Avoid pumping*.—Amateurs almost invariably read into the child's responses their own knowledge. In consequence, they proceed to "pump" the right answer out by hinting, suggesting, and quizzing: "You mean thus and so, don't you?" "Isn't it really this?" etc.

5. *Follow directions*.—The besetting sin of the amateur tester is his proneness to modify the conditions of administering the tests. It cannot be said too emphatically that the primary rule in the use of mental tests is: "Follow directions." Put negatively, if the slang be permitted: "Don't monkey with your method." In especial, don't alter the instructions given to the child in the tests.

6. *Sidelights*.—Be on the watch for the numerous indirect indications of the child's mental processes. To the skilful examiner the attitude and manner of the child will convey valuable hints supplementary to the actual replies. Make full notes on the record blank of these accessory symptoms of mentality.

7. *Order of tests*.—Begin with a number of relatively simple tests. The pictures and the definitions, for example, are always interesting and frequently supply the examiner at the outset with an approximate notion of the child's status. Do not follow strictly the order on the record blank. Intersperse difficult with easy tests.

8. *Range of testing*.—The narrowest range permissible is from the lowest age at which all the tests are passed to the highest age at which

any single test is passed. If the results show considerable irregularity (much "scattering"), it will be necessary to widen this range.

9. *Recording*.—If no stenographic or clerical assistance is feasible, make the attempt, nevertheless, to set down, as soon as it is made, a full record of the child's responses. It is impossible to fill these in later from memory. Moreover, it frequently becomes desirable to know afterward, not merely that the child passed or failed in a given test, but just precisely what his response was.

10. *Anamnesis*.—It is usually worth while to record a tolerably full account of the child's personal history, since it is impossible to be sure that this information will not be wanted afterward in dealing with the case. The following items are recommended: (*a*) child's name in full, (*b*) sex, (*c*) date of birth, (*d*) name of school, (*e*) school grade, (*f*) date and hour of examination, (*g*) name of examiner, (*h*) name of person proposing the examination, (*i*) name of teacher, (*j*) names and addresses of parents, (*k*) occupation of parents, (*l*) number of children in family and their sex, (*m*) illnesses of pupil, (*n*) obvious physical defects or peculiarities, (*o*) conduct in school, (*p*) proficiency in school, (*q*) other items pertinent to the child in question.<sup>1</sup>

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BOUND VOLUMES  
OF  
THE YEARBOOKS OF THE SOCIETY  
I-XXIX

The yearbooks of the National Society for the Study of Education form the outstanding feature of its activities. In the earlier days of the Society these publications were comparatively small in size, though not in importance of their topics or in authoritative-ness of their producers. From the first, the policy was adopted of issuing the yearbooks in advance of the meeting at which they were to be discussed. As long as the membership of the Society was limited to a small group of active participants, the annual meetings were perhaps of even more importance than the printed material which formed the subject matter for discussion. But as the Society's membership increased and as the number of non-members attracted to its meetings also increased, the difficulty of holding these intimate discussions likewise increased, the meetings gradually shifted in character, so that the formal presentation of addresses came to assume more, and the discussions less importance—a change which many members deplored, but which it has seemed impossible to avoid. At the same time, the commercial sales of yearbooks not distributed to members in return for their dues correspondingly increased and gradually affected the functions of the Society in ways that could hardly have been foreseen at the outset. More particularly, the financial returns from the sales of its yearbooks have produced for the Society a source of income which has increased like the proverbial snowball, and which has brought it about that the Society is to-day in some respects more nearly a publishing society than a society for the holding of meetings and discussion of educational topics. In other words, the production and distribution of its yearbooks, rather than the holding of its annual meetings, has come to be the chief method by which the Society is now influencing the trend of educational thinking and practice. As will be seen by a glance at the statements given in the annual reports of the Secretary, the sums now available to the Society from the sale of its yearbooks have reached very considerable proportions. The policy of the officers of the Society has been consistently to return these profits to the members of the Society,

partly by issuing yearbooks that often cost most to deliver to its members than the dues received in return, partly by subsidizing more effectively the work of the various committees that are at work upon the production of forthcoming yearbooks.

All in all, then, the yearbooks of the National Society for the Study of Education are in many respects a feature unique among educational organizations. As to their intrinsic worth as educational documents, there need be no argument; their ready sale, the repeated requests for permission to quote from their pages, and the numerous enthusiastic unsolicited endorsements from our members are sufficient testimony.

## SUMMARY OF YEARBOOKS I-XXIX

The following is a list of the fifty-six books published to date (1930) together with the names of the contributors and a brief synopsis of the contents of each book. Perusal of this summary will show the scope and importance of the Society's publications.

### VOLUME ONE

#### THE FIRST YEARBOOK, PART I (1902)

##### SOME PRINCIPLES IN THE TEACHING OF HISTORY

Lucy M. Salmon

This first yearbook of the Society is a concise and stimulating discussion of the principles underlying the teaching of history. The author devotes various sections of the paper to a discussion of the place of the sources in the school course, the historian in relation to the selection of materials, the relation of history to other subjects, and changes in the methods of teaching it. The concluding section gives an outline of the history recommended for use in the twelve grades.

#### THE FIRST YEARBOOK, PART II (1902)

##### THE PROGRESS OF GEOGRAPHY IN THE SCHOOLS

W. M. Davis and H. M. Wilson

Some of the best principles which govern the teaching of geography to-day are set forth in this early yearbook of the Society. Mr. Davis, the author of the major portion of the volume, deplors the deficiency of higher learning in the field, urges better training of teachers in the subject matter, stresses the need of subordinating detailed items to general principles, points out the importance of showing causal relations in teaching the subject, and advocates better and more extensive use of equipment of geographical laboratories. Some space is devoted to a discussion of ontography, systematic and regional physi-

ography, and systematic and regional geography, with brief reference to their places in the curriculum. The concluding chapter, by Mr. Wilson, discusses the relation of geography to the sciences.

## THE SECOND YEARBOOK, PART I (1903)

### THE COURSE OF STUDY IN HISTORY IN THE COMMON SCHOOLS

Isabel Lawrence, Charles A. McMurry, Frank McMurry,  
Edward C. Page, and Emily J. Rice

The major portion of this yearbook is devoted to a course of study in history for grades three to eight inclusive, prepared by Charles A. McMurry. Particular recognition is given to the intimate relation between history and reading and geography. A brief course in geography is outlined for use with the subject matter in history and reading. The final chapters of the volume are a series of interesting papers discussing Miss Salmon's presentation of the principles of teaching history, which appeared as Part I of the First Yearbook.

## THE SECOND YEARBOOK, PART II (1903)

### THE RELATION OF THEORY TO PRACTICE IN EDUCATION

David Felmley, Manfred J. Holmes, John A. Keith, and Levi Seeley

Under the chairmanship of John A. Keith, a committee of the Society undertook a careful study of the relation of theory to practice in education in (a) universities, (b) normal schools, and (c) city training schools. The plans of the committee embraced a historical account of earlier procedure in each of these types of institutions, an account of contemporary procedure, an investigation of the most effective relation of theory to practice under various forms of institutional organization, and a study of the relative values and essentials of some nine fields of subject matter offered in those institutions. This yearbook is devoted largely to the Committee's report on the situation in the normal schools.

## THE THIRD YEARBOOK, PART I (1904)

### THE RELATION OF THEORY TO PRACTICE IN THE EDUCATION OF TEACHERS

Sarah C. Brooks, John Dewey, C. H. Farnsworth, F. M. McMurry,  
G. R. Richards, D. E. Smith, and T. D. Wood

This yearbook consists of three sections: (1) a paper by John Dewey, entitled "The Relation of Theory to Practice in Education," (2) further treatment of the same topic in a paper by Sarah C. Brooks, and (3) a description of the "Theory and Practice at Teachers College, Columbia University" by the remaining contributors. The secretary's report, referring to the meeting at which this yearbook was discussed, states: "The entire time was devoted to the discussion of Dr. John Dewey's paper. . . . This paper stirred up a good deal of vigorous thinking and provoked a great deal of highly valuable discussion." Dr. Dewey pointed out the artificiality of the conditions under which so-called practice is secured in those situations where young teachers gain

their experience by taking immediate control of a room under the observation of a superior supervisory officer. As a substitute for this method, he proposed that while the student was acquiring his knowledge of subject matter, theory, and principles, he should devote long periods to the observation of both skilled teachers and children at work in the classroom. This was to be followed by an assistantship to the teacher, which should lead gradually to experience in actual teaching.

### THE THIRD YEARBOOK, PART II (1904)

#### NATURE STUDY

Wilbur S. Jackman

The author of this yearbook has three objects in mind: to show (1) that nature study must be presented in accordance with the general principles of psychology which apply to all other subjects; (2) that it is necessary to start with broad, general views or pictures of nature and proceed gradually to the details; and (3) that nature study forms but a part of education, since its relationships reach into all other subjects which go to make up the whole. He suggests salient centers of subject matter and points out principles of method, carrying through the whole a due regard for the needs of the young and growing mind. The book is illustrated and contains a suggestive course of study.

### THE FOURTH YEARBOOK, PART I (1905)

#### THE EDUCATION AND TRAINING OF SECONDARY TEACHERS

S. D. Brooks, J. F. Brown, J. S. Brown, C. DeGarmo, E. G. Dexter, E. C. Elliott,  
C. B. Gilbert, G. S. Hall, R. P. Halleck, M. J. Holmes, E. J. James,  
L. H. Jones, L. C. Lord, A. F. Nightingale, M. V. O'Shea,  
H. H. Seerley, C. C. Van Liew, and J. N. Wilkinson

The two central problems of this yearbook are: (1) What constitutes the ideal secondary teacher?; and (2) By what selective process and preparation can the realization of this ideal be promoted? These problems are considered under five divisions: (1) an historical sketch, which seeks to trace briefly the genesis of secondary schools in their relation to the life of the people; (2) a presentation of the opinions of five experienced secondary-school men as to what constitutes the ideal secondary-school teacher; (3) an examination of the status and personnel of secondary teachers in the United States; (4) a survey of the provisions for the preparation of secondary-school teachers made by universities, normal schools, and colleges; and (5) a consensus of opinion as to the relative advantages and limitations of universities and normal schools in preparing secondary-school teachers.

### THE FOURTH YEARBOOK, PART II (1905)

#### THE PLACE OF VOCATIONAL SUBJECTS IN THE HIGH-SCHOOL CURRICULUM

J. Stanley Brown, Gilbert B. Morrison, and Ellen H. Richards

Three main groups of vocational studies have been treated in this yearbook: commercial work, manual training, and domestic science. These topics



are discussed in relation to their then present status, and their possibilities for future development. The concluding chapters of the book are devoted to a discussion of Part I of the Fourth Yearbook.

## VOLUME TWO

### THE FIFTH YEARBOOK, PART I (1906)

#### ON THE TEACHING OF ENGLISH IN ELEMENTARY AND HIGH SCHOOLS

George P. Brown and Emerson Davis

This yearbook opens with a theoretical dissertation on what Mr. Brown considers the philosophical background for the efficient teaching of English. From this he proceeds to a more practical discussion of methods of teaching English in the primary and grammar grades and in the high school. The latter part of the book describes the course of study in English in the primary grades of the public schools of Cleveland.

### THE FIFTH YEARBOOK, PART II (1906)

#### THE CERTIFICATION OF TEACHERS

Ellwood P. Cubberley

This yearbook sets forth in some detail the conditions prevailing in 1906 with reference to the certification of teachers, traces the development of certain tendencies relating to the problem, and offers suggestions as to lines along which improvement might be made.

### THE SIXTH YEARBOOK, PART I (1907)

#### VOCATIONAL STUDIES FOR COLLEGE ENTRANCE

W. J. S. Bryan, C. A. Herrick, H. W. Holmes, T. de Laguna, and  
V. Prettyman

Continuing the discussion begun in Part II of the Fourth Yearbook, this yearbook takes up those aspects of vocational subjects relating to college entrance.

### THE SIXTH YEARBOOK, PART II (1907)

#### THE KINDERGARTEN AND ITS RELATION TO ELEMENTARY EDUCATION

Ada Van Stone Harris, Patty S. Hill, E. A. Kirkpatrick, Maria Krause-Boelté,  
Harriette M. Mills, and Nina C. Vandewalker

This yearbook is devoted to an investigation of the relation between the kindergarten and elementary school. It was undertaken in order to further the effort to establish the kindergarten more firmly as a part of the public-school system by bridging the chasm which existed between it and the primary grades. It contains a résumé of Froebelian principles, a presentation of both the conservative and the progressive phases of kindergarten education, the history of kindergarten influence in elementary education, and a discussion of the evolution of the kindergarten program.



## THE SEVENTH YEARBOOK, PART I (1908)

### THE RELATION OF SUPERINTENDENTS AND PRINCIPALS TO THE TRAINING AND PROFESSIONAL IMPROVEMENT OF THEIR TEACHERS

Charles D. Lowry

This yearbook is largely a summary of replies to a questionnaire sent to members of the Society and others, asking (1) for opinions as to the need for carrying on systematic work for training the teaching force to a higher degree of efficiency, and (2) for statements of the nature of such work in those schools in which it was carried on. The replies pointed to the conclusion that the greatest essential for a teacher's life and growth is vigorous, systematic study, preferably in courses under the direction of higher institutions of learning. Various plans for attaining this result are presented in this volume.

## THE SEVENTH YEARBOOK, PART II (1908)

### THE COÖRDINATION OF THE KINDERGARTEN AND THE ELEMENTARY SCHOOL

Margaret Giddings, B. C. Gregory, Jennie B. Merrill, and Bertha Payne

"Supplement to Sixth Yearbook, Part II" is the secondary title of this yearbook. Following the somewhat theoretical discussion of the problem set forth in the earlier yearbook, this one attacks the more practical consideration of how to coördinate the work of the kindergarten and the school. It discusses ways and means of securing organic continuity between the two, shows how the right training of teachers may further the work of coördination, and sets forth the relation of supervision to the question at issue.

## THE EIGHTH YEARBOOK, PART I (1909)

### EDUCATION WITH REFERENCE TO SEX: PATHOLOGICAL, ECONOMIC, AND SOCIAL ASPECTS

Charles Richmond Henderson

## THE EIGHTH YEARBOOK, PART II (1909)

### EDUCATION WITH REFERENCE TO SEX: AGENCIES AND METHODS

Charles Richmond Henderson and Helen C. Putnam

The two parts of the Eighth Yearbook are meant to be considered as a single study. In Part I of the study evidence, drawn from the testimonies and experiences of well-known physicians and social hygienists, is offered to reveal the urgent need for instructing youth in sex hygiene. Part II gives practical suggestions to parents and teachers regarding formal instruction in matters of sex. The study concludes with a helpful paper by Dr. Putnam, entitled "Sex Instruction in the Schools," which is devoted chiefly to showing how this instruction may be presented in the school naturally and wholesomely in connection with biology.

## VOLUME THREE

### THE NINTH YEARBOOK, PART I (1910)

#### HEALTH AND EDUCATION

Thomas Denison Wood

A brief synopsis is given in this yearbook of the different phases of educational administration, supervision, and instruction which have to do with health. It treats of health examinations, school sanitation, the hygiene of instruction, health instruction, and physical education. A helpful bibliography concludes the volume.

### THE NINTH YEARBOOK, PART II (1910)

#### THE NURSE IN EDUCATION

M. Adeline Nutting, Mary L. Read, Isabel M. Stewart, and Thomas D. Wood

Supplementing the discussion in Part I, this volume is devoted to the rôle in education of the professionally trained nurse. It presents some of the important results attained in this field, outlines the scope and possibilities of the work, suggests the relationship of the nurse to the community, and indicates the coördination of the nurse's work with that of parent, regular teacher, school physician, teacher of physical education, and other special teachers whose particular subjects bring them into relation with the health side of education.

### THE TENTH YEARBOOK, PART I (1911)

#### THE CITY SCHOOL AS A COMMUNITY CENTER

C. W. Crampton, Mrs. E. C. Grice, Mrs. S. E. Hyre, H. C. Leipziger,  
C. A. Perry, E. W. Stitt, E. J. Ward, and R. D. Warden

The contributors to this volume have described in a concrete way the extent and character of experiments carried on under their direction for making the school a community center. They include in their discussion methods employed, results secured, concrete incidents, difficulties, criticisms, and suggestions encountered in their experiments, together with comparisons of similar work conducted in other communities.

### THE TENTH YEARBOOK, PART II (1911)

#### THE RURAL SCHOOL AS A COMMUNITY CENTER

E. C. Bishop, B. H. Crocheron, B. M. Davis, Jessie Field, A. B. Graham,  
F. W. Howe, O. J. Kern, and M. T. Scudder

This volume supplements Part I, and treats in a similar manner the problems and considerations involved in making the rural school a community center. It concludes with a bibliography on city and rural schools as social centers.

## THE ELEVENTH YEARBOOK, PART I (1912)

### INDUSTRIAL EDUCATION: TYPICAL EXPERIMENTS DESCRIBED AND INTERPRETED

J. F. Barker, M. Bloomfield, B. W. Johnson, P. Johnston, L. M. Leavitt,  
G. A. Mirick, M. W. Murray, C. F. Perry, A. L. Safford,  
and H. B. Wilson

In this yearbook an attempt is made to bring together accounts of actual progress made in organizing schools for industrial education, to interpret the various lines of experimentation undertaken, and to demonstrate practical possibilities. Each contributor was requested to describe the history, organization, and results of industrial education in his school, to compare his with other schools of the same type, and to show how his particular type of undertaking might contribute toward the whole problem of industrial education. (See the Twenty-Third Yearbook, Part II, for further treatment of this topic.)

## THE ELEVENTH YEARBOOK, PART II (1912)

### AGRICULTURAL EDUCATION IN SECONDARY SCHOOLS

H. F. Button, F. R. Crance, D. J. Crosby, W. H. French, W. R. Hart,  
A. C. Monahan, R. W. Stimson, and G. F. Warren

The aim of this yearbook was to present accounts of what was actually being done in secondary agricultural training in various parts of the United States at the time it was prepared. It represents an analysis of the typical experiments which were under way at that time, and gives some interpretation of each plan and its results.

## THE TWELFTH YEARBOOK, PART I (1913)

### THE SUPERVISION OF CITY SCHOOLS

Franklin Bobbitt, John W. Hall, and J. D. Wolcott

Professor Bobbitt, who contributes the major portion of this yearbook, treats the question of supervision under seven main heads, the most important of which are: the need for definite standards of achievement (with special reference to achievement tests); the necessity of determining under actual conditions the most efficient methods for actual service, and then insisting upon them; the importance of standard qualifications for teachers, with some account of a rating scale; the need for standard preliminary training of teachers; the need for training during service; and the importance of defining for teachers the extent, standards, and methods of work that are expected. The appendix, by Professor Hall, gives an account of the supervision of beginning teachers in Cincinnati. Mr. Wolcott contributes a bibliography on city-school supervision.

## THE TWELFTH YEARBOOK, PART II (1913)

### THE SUPERVISION OF RURAL SCHOOLS

A. S. Cook, J. Davis, L. J. Hanifan, U. J. Hoffman, W. Lund, A. C. Monahan,  
E. M. Rapp, J. E. Warren, and J. D. Wolcott

This is the third yearbook of the National Society to deal with an important phase of the administration of rural schools. The several authors

give accounts of what was actually being achieved in typical situations in various parts of the United States at the time the yearbook appeared.

## VOLUME FOUR

### THE THIRTEENTH YEARBOOK, PART I (1914)

#### SOME ASPECTS OF HIGH-SCHOOL INSTRUCTION AND ADMINISTRATION

E. R. Breslich, L. D. Coffman, W. A. Jessup, and H. C. Morrison

The three sections of this yearbook are devoted to a discussion of re-constructed mathematics, supervised study, and North Central High Schools, respectively. The first discusses very concretely needed re-adjustments in the subject of mathematics. The second presents the fundamental principles at the basis of the movement for supervised study, together with a review of the experiments that had been tried in various parts of the country. The last paper shows that a clear understanding of existing conditions with respect to the quality of the teaching staff is one of the most important steps in the direction of reconstruction of the subjects of the curriculum.

### THE THIRTEENTH YEARBOOK, PART II (1914)

#### PLANS FOR ORGANIZING SCHOOL SURVEYS, WITH A SUMMARY OF TYPICAL SCHOOL SURVEYS

Charles H. Judd and Henry L. Smith

The first paper in this volume treats the problem of school surveys from three angles: the conditions necessitating careful study of local school situations; the forces that can most safely and profitably be intrusted with making local surveys; and a possible method of approach to the problem in cities of from five to fifty thousand inhabitants. The second paper, by Professor Judd, includes accounts of all major surveys up to 1914, and gives a view of the different types of such inquiries.

### THE FOURTEENTH YEARBOOK, PART I (1915)

#### MINIMUM ESSENTIALS IN ELEMENTARY-SCHOOL SUBJECTS—STANDARDS AND CURRENT PRACTICES

W. C. Bagley, S. A. Courtis, F. N. Freeman, W. S. Gray, H. W. Holmes,  
J. F. Hosic, W. A. Jessup, R. G. Jones, H. C. Pryor,  
F. E. Thompson, and H. B. Wilson

This yearbook is the 1915 report of investigators coöperating with the Committee of the Department of Superintendence of the National Education Association on Economy of Time in Education, H. B. Wilson, chairman. Three other important yearbooks of the Society (XVI, Part I; XVII, Part I; and XVIII, Part II) are devoted to the subsequent reports of this important committee. This report has to do with means of developing a program for economizing time in the elementary school. A general survey is presented, showing how time is at present distributed in representative cities and describing typical experiments for gaining economy. The bulk of the report



deals with minimal standards in reading, handwriting, spelling, composition, grammar, arithmetic, geography, history, and literature, and represents a series of efforts by different contributors to determine for these subjects just what topics or aspects are truly essential.

## THE FOURTEENTH YEARBOOK, PART II (1915)

### METHODS FOR MEASURING TEACHERS' EFFICIENCY

Arthur C. Boyce

The author of this monograph calls attention first to the need for rating teachers and to the many inadequacies of the schemes for rating that are in common use. To meet this need and overcome these weaknesses, he proposes a method for rating which features a selected list of traits, a careful definition of these traits, and a graphic method for doing the rating. He also sets forth the results obtained by his method and discusses the relative importance of the several qualities of merit in teachers. Mr. Boyce's rating scale has attracted much attention and, in its original form or with variations, has been employed in the rating of large numbers of teachers.

## THE FIFTEENTH YEARBOOK, PART I (1916)

### STANDARDS AND TESTS FOR THE MEASUREMENT OF THE EFFICIENCY OF SCHOOLS AND SCHOOL SYSTEMS

B. T. Baldwin, F. W. Ballou, D. C. Bliss, B. R. Buckingham, H. G. Childs,  
S. A. Courtis, E. P. Cubberley, C. H. Judd, George Melcher, E. E.  
Oberholtzer, J. B. Sears, Daniel Starch, G. D. Strayer, M. R.  
Trabue, and G. M. Whipple

This volume is the report of the Committee of the National Council of Education of the National Education Association, under the chairmanship of G. D. Strayer, assisted by several invited collaborators. The fifteen chapters are grouped into two sections. Section I deals with the derivation of scales and units of measurement, including scales for physical growth and for arithmetic, score cards for city school buildings, and completion tests for school use. Section II deals with the application of scales and units of measurement in the work of educational supervision and administration. Among the systems from which accounts of the use of measuring scales are reported are Boston; Montclair; Bloomington, Indiana; Detroit; Salt Lake City; Kansas City, Missouri; Tulsa, Oklahoma; Oakland, California; Cleveland, Ohio; and Madison, Wisconsin.

## VOLUME FIVE

### THE FIFTEENTH YEARBOOK, PART II (1916)

#### THE RELATIONSHIP BETWEEN PERSISTENCE IN SCHOOL AND HOME CONDITIONS Charles E. Holley

The author of this monograph investigated on a fairly comprehensive scale the question: What factors determine the number of years of schooling



received by pupils in the public schools? Among the conclusions reached are these: (1) There is a high correlation between the general cultural advantages of a home and the schooling the children will receive. (2) Environmental influences more often cause a child to stop attending school than lack of ability. (3) Early elimination from school is largely due to factors over which the school has little or no control. (4) High schools are largely attended by the children of the "better class." (5) Marriages are distinctly affected by "educational selection." (6) A family tradition of schooling is effective in inducing unusual persistence in school in some cases.

### THE FIFTEENTH YEARBOOK, PART III (1916)

#### THE JUNIOR HIGH SCHOOL

Aubrey A. Douglass

This monograph, which is accompanied by a bibliography of 173 titles, presents an excellent account of the junior high school as it existed in 1916. In the Appendix, particularly, will be found a general summary of the situation based on information from 100 American cities. The body of the volume discusses the general problems involved, the arguments for and against this type of school, its curriculum, its housing, and the characteristics of adolescence that it attempts to meet and utilize.

### THE SIXTEENTH YEARBOOK, PART I (1917)

#### SECOND REPORT OF THE COMMITTEE ON MINIMAL ESSENTIALS IN ELEMENTARY-SCHOOL SUBJECTS

W. C. Bagley, W. W. Charters, F. N. Freeman, W. S. Gray, Ernest Horn,  
J. H. Hoskinson, W. S. Monroe, C. F. Munson, H. C. Pryor,  
L. W. Rapeer, G. M. Wilson, and H. B. Wilson

This yearbook is the 1917 report of investigators coöperating with the Committee on Economy of Time of the Department of Superintendence of the National Education Association, H. B. Wilson, chairman, and is the second printed report of that committee. It contains a further report on every subject discussed in the first report (Fourteenth Yearbook, Part I) and also a preliminary report on physical education. In this report the emphasis is upon the social value of the content of the several school subjects as a basis for the instruction given in them.

### THE SIXTEENTH YEARBOOK, PART II (1917)

#### THE EFFICIENCY OF COLLEGE STUDENTS AS CONDITIONED BY AGE AT ENTRANCE AND SIZE OF HIGH SCHOOL

B. F. Pittenger

The author of this monograph sought by statistical methods to answer two questions: Is the quality of work done by college students affected by the age at which they enter or by the size of the high school from which they come? His results, based on a study of 828 students at the University of Minnesota, show, among other things, (1) that those entering before 18 years

of age did better work than those who entered at 18 or later, (2) that graduates of public schools did better work than graduates of military, private, or church schools, (3) that graduates of large schools did better work than graduates of small schools, (4) that the women did better work than the men, and (5) that elimination from the college, especially in the freshman year, is highly qualitative, in that the good students tend to remain and the poor ones to leave.

## THE SEVENTEENTH YEARBOOK, PART I (1918)

### THIRD REPORT OF THE COMMITTEE ON ECONOMY OF TIME IN EDUCATION

W. C. Bagley, B. B. Bassett, M. E. Branom, Alice Camerer, J. E. Dealey,  
C. A. Ellwood, E. B. Greene, A. B. Hart, J. F. Hasic, E. T. Housh,  
W. H. Mace, L. R. Marston, H. C. McKown, A. E. Mitchell,  
W. C. Reavis, D. Snedden, and H. B. Wilson

This is the 1918, or third (printed) report of the Committee of the Department of Superintendence of the National Education Association on Economy of Time in Education, and is prepared by various coöperating investigators. Like the first and second reports, printed as yearbooks of this Society, it deals primarily with studies concerning the minimal essentials of various elementary-school subjects, including arithmetic, geography, reading, composition, civics, and history. A special feature of this report is a symposium on the purposes of historical instruction in the seventh and eighth grades, arranged by W. C. Bagley, and contributed to by Professors Dealey, Ellwood, Greene, Hart, Mace, and Snedden. With the exception of this symposium, the various articles in this yearbook deal with actual investigations of the content of the curriculum, especially in its relation to the needs of daily life.

## VOLUME SIX

### THE SEVENTEENTH YEARBOOK, PART II (1918)

#### THE MEASUREMENT OF EDUCATIONAL PRODUCTS

E. J. Ashbaugh, W. A. Averill, L. P. Ayres, F. W. Ballou, Edna Bryner,  
B. R. Buckingham, S. A. Curtis, M. E. Haggerty, C. H. Judd,  
George Melcher, W. S. Monroe, E. A. Nifenecker,  
and E. L. Thorndike

The writers of this yearbook prepared it as representatives of the National Association of Directors of Educational Research (now the Educational Research Association) with the intent "to gather into one handy volume a rather complete statement of the various aspects of a new movement which seems destined to have a profound and permanent influence upon American Education." From the ready reception accorded the yearbook, it is not too much to say that this "rather complete statement" had, itself, a quite considerable influence in furthering the movement for educational measurement. Among the topics considered were: the history of educational measurement, the nature and purposes of such measurement, the organization of bureaus of research, a list of existing tests and scales, an exposition of statistical terms and methods, and suggestions for future development.

## THE EIGHTEENTH YEARBOOK, PART I (1919)

### THE PROFESSIONAL PREPARATION OF HIGH-SCHOOL TEACHERS

G. N. Cade, S. S. Colvin, Charles Fordyce, H. H. Foster, T. W. Gosling, W. S. Gray, L. V. Koos, A. R. Mead, H. L. Miller, F. C. Whitcomb,  
and Clifford Woody

The first 160 pages of this "double number" are devoted to a description by H. L. Miller of the University of Wisconsin plan for the preparation of high-school teachers. Section II contains three chapters by Gosling, Colvin, Koos, and Woody on miscellaneous aspects of the problem of teacher-training. Section III, which the remaining contributors prepared, is a report of the Committee of the Society of College Teachers of Education on Practice Teaching for Secondary Teachers. The volume as a whole thus contains not only important analyses of prevailing conditions in the training of high-school teachers, but also suggestive accounts of several novel experiments looking toward the bettering of the deficiencies found to exist in the preparation of such teachers.

## THE EIGHTEENTH YEARBOOK, PART II (1919)

### REPORT ON ECONOMY OF TIME IN LEARNING: FOURTH REPORT OF COMMITTEE ON ECONOMY OF TIME IN EDUCATION

F. C. Ayer, F. N. Freeman, W. S. Gray, Ernest Horn, W. S. Monroe,  
C. E. Seashore, and H. B. Wilson

This group of investigators operated as a sub-committee of the committee that was responsible for three preceding yearbooks bearing similar titles. The group took as its task the formulation of rules, or recipes, by which economy could be secured in education, not by better selection of topics for instruction (stressed in the preceding reports), but by improved methods of teaching which had been selected. The yearbook, accordingly, takes the form of a series of statements of fundamental principles which investigation, or the best expert opinion, has shown should be followed in teaching writing, reading, spelling, arithmetic, drawing, and music. This 'meaty' report has been much quoted and decidedly influential.

## VOLUME SEVEN

### NINETEENTH YEARBOOK, PART I (1920)

#### NEW MATERIALS OF INSTRUCTION

A Committee of the Society was created in 1918 under the title "Committee on Materials of Education," which had for its members Messrs. W. C. Bagley, J. C. Brown, C. E. Chadsey, L. D. Coffman, E. P. Cubberley, E. C. Elliott, H. C. Morrison, G. D. Strayer, G. M. Whipple, and C. H. Judd, chairman. With the coöperation of numerous persons this Committee assembled as their first report detailed examples of new materials of instruction, particularly in the fields of reading, geography, history, nature study, mathematics, and community life. The Committee stressed the importance of inducing school boards to set aside each year a certain amount of instructional energy for the purpose

of making similar new materials of instruction. (For further discussion of this topic, see the Twentieth Yearbook, Part I.)

## NINETEENTH YEARBOOK, PART II (1920)

### CLASSROOM PROBLEMS IN THE EDUCATION OF GIFTED CHILDREN

Theodore S. Henry

Dr. Henry summarized various types of flexible promotion schemes, described typical special rooms for gifted pupils, and then recounted at length the methods and results of an experimental room for gifted pupils organized at Urbana, Illinois. The closing chapters, in addition to a six-page bibliography, discuss the problem of adapting classroom methods to the training of gifted children, and present a series of eighteen specific recommendations for carrying on this type of educational endeavor. (For further discussion of this topic, see the Twenty-Third Yearbook, Part I.)

## THE TWENTIETH YEARBOOK, PART I (1921)

### SECOND REPORT OF THE SOCIETY'S COMMITTEE ON NEW MATERIALS OF INSTRUCTION

Frances Berry, Edna Keith, F. J. Kelly, W. N. Kerr, H. G. Lull, Nellie R. Olson, Nina Vandewalker, F. L. Whitney, and Numerous Collaborators

The Society's Committee (the same as that for the Nineteenth Yearbook, Part I), under the chairmanship of F. J. Kelly, appointed as sub-committee chairmen the persons listed above, who gathered and organized 295 detailed examples of new materials of instruction, and classified them for use in the kindergarten, the various elementary grades, the junior and the senior high school, and in special classes for the subnormal. These exercises, or 'projects,' all possess a degree of novelty and by the strong appeal they make to children are decidedly suggestive to teachers who are searching for material outside that of the regular textbooks or ordinary supplementary reading. This yearbook, like its predecessor on the same topic, may be regarded as a portion of the contribution made by this Society toward the reorganization of the curriculum.

## THE TWENTIETH YEARBOOK, PART II (1921)

### REPORT OF THE SOCIETY'S COMMITTEE ON SILENT READING

May A. Burgess, S. A. Courtis, C. E. Germane, W. S. Gray, H. A. Greene,  
Reginia R. Heller, J. H. Hoover, James A. O'Brien, J. L. Packer,  
Daniel Starch, W. W. Theisen, G. A. Yoakum, and Repre-  
sentatives of the School Systems of Cedar Rapids,  
Denver, Iowa City, and Racine

The Executive Committee of the Society appointed a Committee on Silent Reading, under the chairmanship of Earnest Horn, which gathered the material in this volume as its report. Section I comprises ten chapters concerned with investigations of various aspects of the problem of reading, as for instance, the difficulties encountered in teaching silent reading, the measurement of speed and comprehension of silent reading, the vocabularies and contents of readers, and the development of reading speed. Section II contains examples



of concrete exercises which have actually been tried in the classroom for teaching silent reading. This yearbook may be regarded as intermediate in scope and purpose between the several treatments of reading in the earlier yearbooks on minimal essentials and the economy of time and the elaborate treatment of reading in the Twenty-Fourth Yearbook, Part I.

## VOLUME EIGHT

### TWENTY-FIRST YEARBOOK, PARTS I AND II (1922)

#### INTELLIGENCE TESTS AND THEIR USE

S. S. Colvin, Helen Davis, Bessie L. Gambrill, Henry W. Holmes, W. K. Layton, W. S. Miller, Rudolph Pintner, Agnes L. Rogers, H. O. Rugg, M. R. Trabue, E. L. Thorndike, and G. M. Whipple

Under the chairmanship of the late S. S. Colvin, this Committee of the Society produced this yearbook of 270 pages in the attempt to explain "in a clear and accurate manner the theory, nature, and practical use of intelligence tests." Its two parts are bound in one cover. Part I treats of 'general intelligence,' its nature, how it may be measured, how mental tests have developed, and their essential characteristics. Part II treats in considerable detail "the administrative uses of intelligence tests in various grades, beginning with the primary grade and ending with the college and university." In addition to a wide circulation among schoolmen, this yearbook has been extensively used for purposes of instruction in normal schools and colleges.

### TWENTY-SECOND YEARBOOK, PART I (1923)

#### ENGLISH COMPOSITION: ITS AIMS, METHODS, AND MEASUREMENT Earl Hudelson

By means of questionnaires the author sought to discover from teachers of English what their actual aims and methods were with respect to composition. He next considered the means employed for determining the extent to which these aims were being attained and was led to devise and to standardize two scales for the measurement of English composition. His principal contention is that most composition scales test only how well the pupil can write upon that particular topic, not how well he can possibly write. For the latter purpose he proposes his Maximal Composition Ability Scale. To determine accurately from time to time the extent to which the pupils are exercising their real ability, he proposes another device known as the Typical Composition Ability Scale. Detailed instructions are given for the use of these two scales.

### TWENTY-SECOND YEARBOOK, PART II (1923)

#### THE SOCIAL STUDIES IN THE ELEMENTARY AND SECONDARY SCHOOL

A. S. Barr, J. J. Coss, Henry Harap, R. W. Hatch, H. C. Hill, Ernest Horn, C. H. Judd, L. C. Marshall, F. M. McMurry, Earle Rugg, H. O. Rugg, Emma Schweppe, Mabel Snedaker, and C. W. Washburne

This group of writers, under the direction of H. O. Rugg, has presented in this 324-page yearbook important and somewhat radical proposals concerning



the portion of the curriculum devoted to the social studies. Section I analyzes current practices, shows how social science curricula came to be what they are, and points out needed changes. Section II presents samples of reorganized courses in this field in several schools. Section III discusses the method by which such reorganizations of the curriculum should be carried on. Section IV is a critical appraisal of F. M. McMurry of the proposed reorganizations. This volume may be regarded as one of several fore-runners of the proposed year-books on the Technique of Curriculum-Making. It applies, obviously, primarily to the geographical and historical portions of the curriculum.

## VOLUME NINE

### TWENTY-THIRD YEARBOOK, PART I (1924)

#### THE EDUCATION OF GIFTED CHILDREN

B. T. Baldwin, Helen Davis, Lillie R. Ernst, F. N. Freeman, T. S. Henry, Ernest Horn, H. O. Rugg, L. O. Smith, L. M. Terman, C. W. Waddle, and G. M. Whipple, chairman (the Society's Committee)

assisted by

J. R. Benson, E. R. Breslich, Arthur Brogue, Margaret V. Cobb, R. R. Cook, J. C. DeVoss, Anna M. Engel, E. M. Haney, H. C. Hill, K. J. Hoke, Leta A. Hollingworth, A. J. Martin, E. L. Moyer, Mary L. Patrick, W. C. Reavis, Grace A. Taylor, H. G. Townsend, C. W. Washburne, and W. L. Uhl

This extensive yearbook (443 pages of text) may be regarded as an attempt to gain further light and a more varied and comprehensive survey of the problem discussed in the Nineteenth Yearbook, Part II. Section I contains various reports and summaries of the more general aspects of the problem—the history of the movement for special training of the gifted, methods of locating such children, problems of organization and administration, the adaptation of the curriculum, non-intellectual traits of gifted children, etc. Section II presents numerous special studies of such children, with respect to their physical and mental traits, their educational achievements, their subsequent careers in the high school and university, and the outcomes of various school experiments in providing special training for them. Section III is a valuable annotated bibliography of 453 titles.

### TWENTY-THIRD YEARBOOK, PART II (1924)

#### VOCATIONAL GUIDANCE AND VOCATIONAL EDUCATION FOR THE INDUSTRIES

A. H. Edgerton and Fifty Collaborators

This yearbook is one of the largest ever undertaken by the Society. The material for it was gathered and organized by Professor Edgerton from many sources and with the aid of half a hundred contributors. It affords, therefore, a comprehensive exposition of the present status of the branch of educational endeavor to which it is devoted. Section I, which deals with vocational guid-

ance, gives detailed accounts of what is already being done in various city schools systems, both large and small, and in colleges and universities, also accounts of methods of training vocational counselors. Section II deals with vocational education for the industries. It shows what is being done in typical part-time, or continuation, schools and in typical day and evening industrial courses in smaller cities. Further, there is discussion of the training of workers in industry, the training of foremen, and the training of teachers for vocational industrial schools. Both sections are supplied with bibliographies.

## VOLUME TEN

### TWENTY-FOURTH YEARBOOK, PART I (1925)

#### REPORT OF THE NATIONAL COMMITTEE ON READING

F. W. Ballou, W. S. Gray, Rose L. Hardy, Ernest Horn, Frances Jenkins,  
S. A. Leonard, Estaline Wilson, and Laura Zirbes

Under the chairmanship of W. S. Gray, this Committee, appointed by Commissioner Tigert in January, 1923, subsidized by the Commonwealth Fund, and assisted by numerous school and university specialists, has used the avenue of publication afforded by this Society to present what is one of the most authoritative and most useful general discussions of the problem of reading that has been made available. Among the topics considered are: the aims of instruction in reading, a modern program of reading instruction for the elementary grades and the high school, methods of developing a meaningful vocabulary, the relation of reading to literature and the other content subjects, materials for instruction, standardized and informal reading tests, recognition of individual differences by diagnosis and remedial work. A feature of the book is the series of specific recommendations in which the members of the Committee, by discussion and experiment, have been able to concur.

### TWENTY-FOURTH YEARBOOK, PART II (1925)

#### ADAPTING THE SCHOOLS TO INDIVIDUAL DIFFERENCES

Franklin Bobbitt, B. R. Buckingham, S. A. Courtis, W. S. Gray, Ernest Horn,  
Jessie Mackinder, Helen Parkhurst, A. H. Sutherland, Mary A. Ward,  
C. W. Washburne, chairman (the Society's Committee)

assisted by

Cecilia Anderson, R. N. Brown, Grace E. Carter, F. E. Clerk, Mary H. Comings,  
U. J. Hoffman, Hilda M. Holmes, W. H. Holmes, W. H. Kilpatrick,  
S. A. Leonard, J. L. McCrory, H. L. Miller, W. C. Reavis,  
Margaret Smith, A. J. Stoddard, Elizabeth T. Sullivan,  
L. Belle Voegelcin, and W. A. Wirt

Section I of this important yearbook describes the factors which under ordinary school conditions tend to produce maladjustments of pupils with respect to grading and rate of progress. Section II follows with a description of typical attempts to meet these difficulties by adjusting the school's organiza-

tion and methods of instruction. Section III details statistical results of experiments in the individualization of instruction, with special reference to the work at Winnetka. Section IV discusses the various problems which are encountered in thus adapting schools, and Section V outlines the steps involved in launching a program of this sort. Section VI is a critique of these proposals, while Section VII comprises an annotated bibliography of 76 pages.

## VOLUME ELEVEN

### TWENTY-FIFTH YEARBOOK, PART I (1926)

#### THE PRESENT STATUS OF SAFETY EDUCATION

M. B. Hillegas, A. B. Meredith, Z. E. Scott, A. W. Whitney, S. J. Williams,  
and G. M. Whipple, chairman (of the Society's Committee)

assisted by

Rena Allen, Mary N. Arrowsmith, Harriet E. Beard, Mary B. Day, Ruth C.  
Earle, H. S. Gruver, J. H. Harvey, Max Henig, Evelyn T. Holston,  
W. D. Keefer, Frances H. Miner, E. G. Payne, M. S. Pittman,  
Mary O. Pottenger, Idabelle Stevenson, and Ruth Streitz

This yearbook represents the product of coöperation between this Society and the Education Division of the National Safety Council. It traces the development of the safety movement in industry, in the schools, and in civic administration, shows how safety education has been introduced into various school systems, presents at great length and in full detail the materials and methods of a program of safety education for the elementary schools, with additional suggestions for the adaptation and extension of this program for use in high schools, and in rural and vocational schools. The volume concludes with a general discussion of the significance of safety education and the outlook for its future development.

### TWENTY-FIFTH YEARBOOK, PART II (1926)

#### EXTRA-CURRICULAR ACTIVITIES

F. C. Ayer, C. R. Foster, E. K. Fretwell, L. V. Koos, J. G. Masters,  
M. C. Prunty, W. C. Reavis, Earle Rugg, and P. W.  
Terry (the Society's Committee)

assisted by

E. H. Chappelle, F. Fickinger, C. E. Hagie, M. B. Horner, H. C. McKown,  
C. J. Pieper, E. S. Simmonds, and Clifford Woody

Under the chairmanship of L. V. Koos, this Committee and its associates, by extensive canvassing of the country, has brought together a comprehensive statement of the present status of extra-curricular activities in the public schools of the United States. The Committee has not sought primarily to evaluate these varied activities or to prescribe rules for their inauguration or

control, but rather to state current practices with respect to such matters as honor societies, publications, student government organizations, debating, music, athletics, assemblies, and clubs of all kinds. These are discussed for elementary, for junior-high, and for senior-high schools. Special attention is paid to the relation of the teacher to these various enterprises.

## VOLUME TWELVE

TWENTY-SIXTH YEARBOOK, PARTS I AND II (1927)

THE FOUNDATIONS AND TECHNIQUE OF CURRICULUM CONSTRUCTION

William C. Bagley, Franklin Bobbitt, Frederick G. Bonser, Werrett W. Charters,  
George S. Counts, Stuart A. Courtis, Ernest Horn, Charles H. Judd,  
Frederick J. Kelly, William H. Kilpatrick, Harold Rugg (Chairman),  
George A. Works (Members of the Society's Committee)

Associated Contributors

Otis W. Caldwell, Walter D. Cocking, Ellsworth Collings, Flora J. Cooke, J. L.  
Flanders, Harry O. Gillet, John A. Hockett, Marietta Johnson, Margaret  
Naumburg, Jesse H. Newlon, Raymond W. Osborne, Henry Carr  
Pearson, C. A. Phillips, Caroline Pratt, William C. Reavis, Ethel I.  
Salisbury, E. M. Sipple, Eugene R. Smith, A. L. Threlkeld,  
Carleton Washburne

From time to time, in a dynamic society it is imperative that we stand aside from the movement of affairs to review trends, to assay products, to map out new paths. The chief purpose of this Yearbook is a study and appraisal so far as agreement is possible of curriculum making in American schools—past and present.

For two years the Society's Committee was engaged in the development of one phase or another of the work, either in collecting and appraising the contemporary situation, in studying the chief trends of development in the past century or in prolonged round table conferences over similarities and divergences in educational theory.

This Yearbook presents three results of their efforts: a historical review, a description and evaluation of contemporary practices, and a statement of foundational principles for curriculum reconstruction.

Part I of this Yearbook attempts a description and critical synthesis of curriculum-making, past and present. Part II presents the committee's joint platform for curriculum-construction—a general statement of the foundational principles upon which the committee desires to see the next steps taken in the reconstruction of the school curriculum. Also the frank and interesting individual statements of the views of the several members of the committee.



## VOLUME THIRTEEN

### TWENTY-SEVENTH YEARBOOK, PART I (1928)

#### NATURE AND NURTURE: THEIR INFLUENCE UPON INTELLIGENCE

Lewis M. Terman, Barbara S. Burks, Truman L. Kelley, E. L. Thorndike,  
Raymond R. Willoughby, Harold E. Jones, Helen L. Koch, Gladys G.  
Tallman, Mildred Burlingame, Calvin P. Stone, Frank N. Freeman,  
K. J. Holzinger, Blythe C. Mitchell, Agnes L. Rogers, Dorothy  
Durling, Katharine McBride, Joseph Peterson, Katherine  
Murdoch, Doris Maddow, Nettie L. Berg, Gertrude  
Hildreth, Florence L. Goodenough, Carolyn Hoefer,  
Mattie C. Hardy, Lois Doe-Kulmann, Arnold  
Gesell, Janet A. Matthew, Bertha M. Luckey,  
Katharine B. Greene, Mary L. Casey,  
Helen P. Davidson, Doris I. Harter,  
and Arthur I. Gates

Part I contains a very useful and important chapter furnished by Mrs. Herman Ramsperger of Stanford University on difficulties met in the statistical handling of the material of nature-nurture studies. Her section on the discovery and expression of degrees of causation among groups of dependent factors is particularly important, including as it does discussion of path coefficients and coefficients of determination. Other chapters contain a study of the intelligence of siblings by E. L. Thorndike of Teachers College, Columbia University, a comparison of white and negro children in rational learning by Joseph Peterson of George Peabody College for Teachers, a study of the effect of the nursery school upon intelligence by Florence L. Goodenough of the University of Minnesota, and a checking of the effects of training by A. I. Gates of Teachers College, Columbia University. These are grouped under seven heads: (1) Family resemblance; (2) intelligence and social environment; (3) race differences; (4) intelligence and schooling; (5) relation to health or physique; (6) constancy of the IQ; and (7) effects of coaching or special training.

### TWENTY-SEVENTH YEARBOOK, PART II (1928)

#### NATURE AND NURTURE: THEIR INFLUENCE UPON ACHIEVEMENT

Lewis M. Terman, Leta S. Hollingworth, Margaret V. Cobb, J. D. Heilman,  
Katherine M. Denworth, F. P. Obrien, Howard Taylor, M. J. Van  
Wagenen, William A. McCall, T. C. Holy, Lonzo Jones, G. M.  
Ruch, L. Dewey Anderson, June E. Downey, Mark A. May,  
Hugh Hartshorne, Guy M. Whipple, Joseph Peterson,  
M. C. Barlow, P. R. Farnsworth, and Barbara S. Burks

The investigations of Part II of the Yearbook are grouped under five heads: (1) Achievement and intelligence; (2) achievement and school attendance; (3) achievement and teaching ability or school methods; (4) achievement and school expenditures; and (5) achievement and effort.



The basic question asked in Part II is as to whether (1) native ability or (2) public school experience determines levels of pupil achievement in school tasks. The most careful answer is offered in Chapter II, where J. D. Heilman of Colorado State Teachers College reports the use among a group of 828 ten-year old public school children in Denver of expressions of amount for (1) mental age, (2) school attitude, and (3) home status to determine school achievement in terms of educational age. He uses Sewell Wright's path coefficient method and finds that at least "50 percent of the variation in educational age" is due to heredity as measured in the study. School attendance alone accounts for but about 5 percent of the differences in school achievement found in his group of ten-year old pupils, and if the influence of school attendance in combination with mentality be added, not over 13 percent to 19 percent of educational age can be attributed to educational exposure. The implications of these findings for probable necessary length of elementary education are very apparent. The chairman of the Yearbook Committee, L. M. Terman, says, "Results such as those of Heilman open the question as to whether eight years of school attendance is really necessary to bring pupils up to the standard usually achieved by the eighth grade. One wonders whether in the four or five years between ten and fourteen they might not learn to read, write, and spell as well, and master as much arithmetic, history, and geography as they would be likely to in eight years."

## VOLUME FOURTEEN

### TWENTY-EIGHTH YEARBOOK, PARTS I AND II

#### PRESCHOOL AND PARENTAL EDUCATION

Prepared by the Society's Committee

B. T. Baldwin (deceased), Arnold Gesell, Patty S. Hill, Douglas Thom, Edna White, Helen T. Woolley, and Lois H. Meek (Chairman)

Assisted by

W. E. Blatz, Agnes Burke, Grace Caldwell, Lelah M. Crabbs, Bess V. Cunningham, Mary D. Davis, Charlotte G. Garrison, Ernest Groves, Sidonie M. Gruenberg, Ruth Haefner, Francis A. Hungerford, Harriet Johnson, H. E. Jones, Grace Langdon, Elizabeth Lord, Lawson Lowrey, Elizabeth Moore, Mary Murphy, Winifred Rand, Mae Raymond, Mandel Sherman, G. S. Stevenson, Mary Sweeny, Nell B. Taylor, Flora Thurston, Leona Vincent, Beth Wellman, C. A. Wilson, and Elizabeth Woods

The Twenty-Eighth Yearbook is the most significant contribution that has been made to the literature of preschool and parental education. A request for a yearbook in this field was made to the National Society for the Study of Education in February, 1925, and the committee was formally organized in October, 1925. Dr. Lois Hayden Meek, Educational Secretary for the American Association of University Women, was appointed chairman and the other members of the committee were chosen to represent various aspects of preschool and parental education; Dr. Bird T. Baldwin and Dr. Arnold Gesell,

research in child development; Professor Patty Smith Hill, education of young children; Miss Edna N. White, home economics aspect of preschool and parental education; Dr. Helen T. Woolley, psychological aspects of personality problems of childhood; Dr. Douglas Thom, the psychiatric aspect of child problems. A generous grant from the Laura Spelman Rockefeller Memorial, supplementing the appropriation of the National Society for the Study of Education, made possible the work of the Committee.

The seven members of the Committee and the twenty-nine contributors associated with them, have assembled and presented in the Yearbook a most comprehensive survey of the present status of preschool and parental education. In setting forth the Committee's purpose for the Yearbook, Dr. Meek says in the introduction: "The Committee hopes that the present yearbook will help to show the trends of the movement, to point out the need for carefully trained personnel, to emphasize the varied influences of home, school and community life, and to focus attention on the total aspect of child development—physical, emotional and social, as well as intellectual." She further states that the Committee worked and thought together on practically every part of the book in an effort to unify the contributions of the many who supplied the wealth of data, and to present the material concerning the education of children and parents from a point of view which would integrate a movement participated in by many groups with varying objectives and backgrounds.

Throughout the book the term preschool refers "to the whole period of infancy and early childhood, from birth up to elementary school entrance at the age of six or seven." The term parental education is used "in its broadest sense to include all methods and devices of adult education intended to assist parents in the understanding and care of their children."

The book is divided into two parts—Part I on organization and development of preschool and parental education, and Part II on research and method in this field. In Part I, the history of the movement is given, including a brief discussion of the beginnings of the kindergarten, the Montessori school, the nursery school, child health centers, play schools and child study groups. The following general considerations underlying preschool and parental education are stressed: the importance of the preschool years from the standpoint of growth and development, the influence of home and parents, the need of supplementary educational agencies and fundamentally of educating parents themselves. The present organization of education for preschool children is given in considerable detail covering the family as an agency, day nurseries, maternity and infant welfare centers, the clinics, nursery schools and kindergartens. Part II also includes a survey of current programs in parental education and experiments in preparental training, and indicates what is being done in professional training for research and instruction in preschool education, in the professional training of nursery school teachers, and in the training of leaders in parental education.

Part II, on research and method, opens with research activities in the field of child development, indicating the present status of research in child development and citing the outstanding studies of motor, language, intellectual, emotional and social development and of physical growth. A section follows on educating preschool children, with a thorough discussion of child activities,

including those leading to the establishment of routine habits, play, art experiences, language and literature and social development. Provision for individual differences and the records of young children are also introduced. A concluding section deals with methods and materials for the education of parents and of practical ways of educating parents and teachers to the value of mental hygiene.

The Twenty-Eighth Yearbook is a very valuable source book in the field of preschool and parental education—a book which administrators, supervisors, teachers and parents interested in general or specialized education for the preschool child or the parent will find an indispensable addition to their libraries.

## VOLUME FIFTEEN

TWENTY-NINTH YEARBOOK, PARTS I AND II (1930)

REPORT OF THE SOCIETY'S COMMITTEE ON ARITHMETIC

W. A. Brownell, B. R. Buckingham, G. T. Buswell, C. E. Greene, R. L. West,  
F. B. Knight, (Chairman)

Assisted by

E. A. Beito, J. C. Brown, L. J. Brueckner, J. R. Clark, W. F. Dearborn,  
Arthur Edwards, H. L. Harap, Ernest Horn, C. H. Judd, Fred Kelly,  
L. A. King, R. H. Lane, Josephine MacLatchy, C. R. Mead, R. L.  
Morton, Elma A. Neal, G. M. Norem, W. J. Osburn, J. R.  
Overman, Isidoro Panlasigui, Harriet E. Peet, F. G.  
Pickell, A. C. Repp, G. M. Ruch, C. W. Stone,  
Florence Stratemeyer, and C. W. Washburne

The Twenty-Ninth Yearbook of the National Society for the Study of Education was prepared by the Society's committee on arithmetic, of which F. B. Knight is chairman, and the membership includes W. A. Brownell, B. R. Buckingham, G. T. Buswell, C. E. Greene, and R. L. West. Thirty other active members of the Society assisted the committee in the preparation of this 700 page report, or acted as a special reviewing committee, whose critique of the work as a whole appears at the end of the Yearbook.

The Twenty-Ninth Yearbook is divided into two parts. Part I, *Some Aspects of Modern Thought on Arithmetic*, contains an article on "The Social Value of Arithmetic," by B. R. Buckingham; one on "The Arithmetic Curriculum," by West, Greene, and Brownell; on "Some Considerations of Method," by F. B. Knight; on "Testing and Diagnosis," by Greene and Buswell; and on "The Training of Teachers," by B. R. Buckingham.

Part II, *Research in Arithmetic*, contains a study of techniques by W. A. Brownell, a critical survey of previous research in arithmetic, by G. T. Buswell, and reports of eleven hitherto unpublished studies on various pertinent topics. The Appendix contains a *Critique of the Yearbook* by the reviewing committee, Leo J. Brueckner, chairman.

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